

REMINISCENCES OF A FREQUENTER
TO THE
1878-1881 MEETINGS
OF THE
ANTHROPOLOGY SOCIETY OF PARIS

Featuring:

*Classic presentations by Doctor Gustave Le Bon, Henri Martin,
Doctor Paul Broca, Professor Eugène Dally, Doctor Arthur Bordier,
Colonel Émile Duhousset, Girard de Rialle, Doctor Paul Topinard,
Dimitri Anoutchine, Doctor Antoine Foley, Durand de Gros,
the brilliant, young Doctor Léonce Manouvrier, and many others*

Robert K Stevenson: Translator, Editor & Reminiscencer

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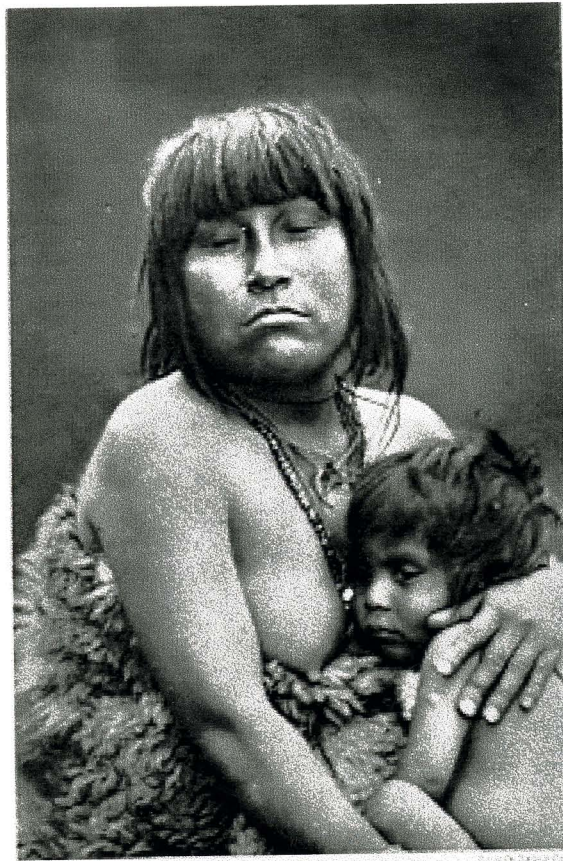
The reminiscencer in 1880

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Professor Eugène Dally, Lev Mechnikov, Doctor Gustave Le Bon,
& the brilliant, young Doctor Léonce Manouvrier*

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Fuegian mother and child

86, rue de Courcelles
Paris, France

June 2, 1929

My dear friend,

Your recent letter and enclosures provided me the greatest pleasure. I most especially appreciated your requesting me to provide you a few recollections of my days as an eager, young scientist frequenting the meetings of the Anthropology Society of Paris. As you know, the rooms have been silent here for all too long; so, I require little prompting to recall something of an uplifting nature.

Given the haphazard manner in which I have stored my accumulation of papers, please forgive me if today I solely focus on 1881, as key papers for that year were readily located in the piles.

Well now, you should remember that 1881 was in many respects a turning point for me. It began normally enough, with occasional colds sandwiching my on-going anthropometric studies. But then in early March, on yet another one of our typically gloomy days, I made my way to the Society's meeting. I wanted to hear what Doctor Bordier had to say on sweating sickness, and found his presentation truly enlightening, as were most of the members' comments.

“On the Special Susceptibility of the Fair-haired Races of Europe For Contracting Sweating Sickness”

by Doctor Arthur Bordier

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 3, 1881

Messieurs, the communication presented last Tuesday by Doctor Rochard to the Academy of Medicine about an epidemic of sweating sickness--an epidemic which has limited itself for the past few months to the small Isle of Oléron along the West coast of France--affords me the opportunity of reporting a hitherto unrecognized fact to you that I point out in my Medical Geography course at the School of Anthropology.

When one closely follows the history of sweating sickness, from its first sudden appearance up to the recent epidemic about which Doctor Rochard has spoken, one is struck by the fact that it always evinces a predilection for the fair-haired races of Europe.

Let me quickly recapitulate the history of sweating sickness:

I

First epidemic. -- In August, 1485, while the rivalry of the Houses of Lancaster and York in England was giving rise to the Wars of the Roses, a new disease burst forth: it was the sweating sickness.

It broke out in the camp of Henry Tudor, who proceeded to win the battle of Bosworth Field over Richard III. Men died after sweating profusely for eight to ten hours.

From the camp at Bosworth Field, the disease spread to the west and east, as far as London: it ravaged all of England, but Scotland and Ireland were spared.

Second epidemic. -- Twenty-two years later, in 1507, a new epidemic, less grave than the first, arose in London itself, whose confines it did not go beyond.

Third epidemic. -- In 1518, the third appearance of the same sickness occurred, this time more serious than the first: sick persons died in two to three hours. The disease carried away in many places one third or even half the population. Scotland and Ireland were again spared; but, for the first time, the malady crossed the channel, appearing in Calais, then under the control of the British.

All who were not English were exempt from its effects.

Fourth epidemic. -- In 1527, a new epidemic of sweating sickness in England manifested itself: it killed its victims in five to six hours. While it again respected Ireland and Scotland, it came to Calais, where it again only struck the English; but a British ship went to Hamburg, losing several men en route. The sweating sickness broke out in Hamburg, where it killed a thousand persons in 22 hours.

From Hamburg the sweating sickness spread to the east, all along the Baltic. It invaded Lübeck, Bremen, Stettin, Danzig, Königsberg, Lithuania, part of Poland, and Livonia where, in 1530, it wiped out two thirds of the population.

To the north it reached Denmark, Sweden, and Norway; in Copenhagen it claimed 400 victims in a single day.

Towards the southwest it attacked Westphalia, Cologne, Speyer, Nuremberg, Strasbourg, Mulhouse, and Augsburg as well, where in eight days it afflicted 1500 people, 800 of whom died.

In the south it invaded Württemberg, the Duchy of Baden, the Palatinate, Bavaria, and Vienna, which at that time was being besieged by the Turks. This was its extent and it did not strike the Turks. One saw it also in Basel, Solothurn, and Bern.

Fifth epidemic. -- April 13, 1551 marked the beginning of a fifth epidemic of sweating sickness, which was even more terrible than the preceding ones. The panic-stricken populations fled to Ireland, Scotland, and France, where they knew that the sweating sickness had not previously reached; but whereas the escapees conveyed with them the contagion and died in Ireland, Scotland, and France, the Irish, Scotch, and French who accepted the fleeing newcomers did not themselves come down with the disease. Furthermore, foreigners from these same three countries who concurrently were in London also did not become affected by the malady.

A medical doctor at the time, Jean Kaye, more popularly known by the name *Caius Britannicus*, had been impressed by this special susceptibility of his compatriots for contracting sweating sickness.

"This disease," he stated, "follows us, we English people, like a shadow; it attacks all who *vivendi ratione et consuetudine factum est britannicum*."

With the opinion of Jean Kaye having received little support, the extension of the sweating sickness into Germany was enough to further discredit it. I myself do not concur with his contention that the English race is uniquely susceptible, my main reason being that there is no English race; but here is what strikes me as particularly significant: 1) in the United Kingdom sweating sickness only invaded those regions inhabited by tall, blond-haired Anglo-Saxons, whereas those areas inhabited by short, dark-haired Celts were spared; 2) whenever the sweating sickness escaped England, it extended itself precisely into the original lands of the Anglo-Saxons.

Where, in fact, did the Angles come from? Tacitus speaks of the Angles as a small people without any prospects, inhabiting the forests of northern Germany, near the Baltic.

And the Saxons? Ptolemy places them between the mouth of the Elbe and the narrow arm of the sea which today we call the Schlei.

Now, it is these Angles and these tall, blond, dolichocephalic Saxons, with blue eyes, who in the fifth and sixth centuries successfully invaded what is today Great Britain, drove back the Celts and thereby confined them to the interior part of the island.

At length in the ninth, tenth, and eleventh centuries these Anglo-Saxons were joined by two fair-haired Scandinavian peoples, themselves also tall, dolichocephalic and blue-eyed: the Danes and Normans.

It is but sufficient to cast one's eyes on an ethnologic map of Europe, and compare it with a map showing the extent of the sweating sickness, in order to see that in the countries where sweating sickness has reigned a tall, blond, dolichocephalic, blue-eyed race predominates, and that the two maps virtually match each other when superimposed.

Sweating sickness, said to be *English*, is therefore in reality a disease affecting the fair-haired races of northern Europe.

II

But a new era of sweating sickness, so to speak, dawned in 1652. At Leipzig, 123 years after the last appearance of the so-called *English sweat*, an abated form of the disease manifested itself, which since then has never ceased to appear on the continent.

In 1818 the same malady established itself in Picardy, and it took the name *Picard sweat*; so, people named the attenuated disease the *Picard sweat*, just as they had named the regular disease the *English sweat*.

Little by little it descended into Normandy, France proper, and Burgundy.

One saw it at Beauvais in 1821; at Poitiers in 1845; in the northern parts of Spain and Italy in 1835 and 1849 respectively; in Holland, in 1850; at Kissinger in 1864. We are now happening to see it in the Isle of Oléron.

Just a minute ago I said that the ethnologic map of the fair-haired populations of Europe and the map of the *English sweat* are superimposable; additionally, I can say that the map of the sweating sickness in Picardy corresponds to the ethnologic map of France showing the intermixture of fair-haired elements with others.

It is in this manner that one spots it first in Picardy, then in the following departments: Pas-de-Calais, Somme, Aisne, Oise, Seine-et-Oise, Seine-Inférieure, Eure, Seine-et-Marne, Aube, Côte-d'Or, Jura, and Bas-Rhin, departments where the tall blond element dominates.

When one looks at the map that Boudin drew up denoting those areas in France containing tall individuals, which correspond to the localities of the fair-haired populations, one will see that

these two maps coincide; one will see the correspondence also in the apparent anomalies.

Hence, according to Boudin's map, whereas individuals of tall height are grouped in the north and northeast of France, two regions stand out as the exception: Charente-Maritime and Hérault.

Doctor Gustave Lagneau has demonstrated that this apparent anomaly will precisely bear out the accuracy of the tall height evidence.

He reminds us that Charente-Maritime counts as its ancestors the tall, blond Alans, and that Hérault reckons amongst its own the Volsci, also tall and fair-haired, both Germanic peoples.

The map of the sweating sickness is in conformity with these anomalies. While the principal departments invaded by it correspond to the distribution of tall individuals and are grouped in the north and northeast, the two exceptions--Charente-Maritime and Hérault, with their tall inhabitants--have also experienced the existence of sweating sickness.

There is not then anything here which should necessarily surprise us: after all, has not Doctor Magitot demonstrated that susceptibility to tooth decay is more marked among these same blond races? Don't we know that their constitution--and I mean by this their physical make-up of liquids and solids--differs? It is easy to understand how these physiochemical differences form in the bodily interior of the fair-haired races an environment more conducive to the culture of the microbe responsible for the sweating sickness than the internal environment of the dark-haired races. Along these lines, you may recall that Darwin has shown that certain morbid predispositions vary among dark-skinned and light-skinned pigs. Without entertaining this matter any further, I must conclude, messieurs, that Europe's fair-haired races' susceptibility to sweating sickness is therefore nothing but the conformance to the laws of biology.

DISCUSSION

Monsieur HENRI MARTIN. Doctor Bordier, I must ask you why the epidemics have spared Ireland and Scotland. In these two countries, after all, the fair-haired race is extremely numerous. In Ireland one finds such people distributed throughout the entire island, many more, in fact, inhabiting the west and south than I had even believed before I visited those areas. One can pose this same question regarding Brittany.

Doctor FELIX-HENRI DE RANSE. I did not hear you cite, Doctor Bordier, in your summary of the epidemics of the sweating sickness an outbreak of the epidemic that extended itself throughout Lot-et-Garonne during the reign of Louis-Philippe. Several of my relatives--all dark-haired, brachycephalics, and of short height--were struck by the disease.

Professor JULES PARROT. Doctor Bordier, you omitted mentioning the epidemic of the sweating sickness which around 1842 exercised such great havoc upon the department of Dordogne. One of my relatives conducted an excellent study of this epidemic. It is true that this department had lately been occupied by the English for a sufficiently long time.

Doctor FELIX-HENRI DE RANSE. The epidemic which you have just talked about,

Professor Parrot, is the same one that attacked Lot-et-Garonne at about the same time.

Pastor AUGUSTE ESCHENAUER. Messieurs, I was at Sainte-Foy in 1842 as a 15-year-old student, and I personally remember this epidemic. Doctor Broca, founding father of our Society, took care of many of us for this illness which had claimed so many victims outside of the school where we were.

Around 1853-54, I recall that there was an epidemic of the sweating sickness in Paris.

Doctor ÉMILE MAGITOT. An epidemic of sweating sickness broke out also in 1854 in Haute-Marne and Haute-Saône. I was able to observe it first hand by reason of a mission which I had conducted in the regions affected at that time by cholera. The epidemic, in fact, succeeded the cholera, which happened to take numerous victims, and was by itself very deadly.

Doctor Bordier has, moreover, mentioned this epidemic during his presentation.

Doctor ARTHUR BORDIER. The story that you related, Doctor de Ranse, regarding short, dark-haired, brachycephalic individuals being attacked by the sweating sickness does not appear to me to constitute an argument against the conclusion that I have formulated. People may be short and brachycephalic, but nonetheless still belong to the fair-haired race. Likewise many persons might possess all the exterior attributes of the dark-haired race and yet have assumed from the fair-haired race a special susceptibility for contracting sweating sickness.

Keep in mind that there is not one department in France in which there are no men belonging to the fair-haired race. The research that I have presented you is based solely upon their more or less considerable proportion.

If physicians would take a survey of the number of light and dark-haired individuals among their clientele that have come down with the sweating sickness, this data would be of great importance.

Now, in certain departments, such as Indre-et-Loire or Vienne, there are no, as it were, periods of the year where one does not observe a small epidemic of sweating sickness in progress. It is true that what might apply to these departments' persistent sweating sickness outbreaks is the observation you made, Professor Parrot, regarding Dordogne, which was that the English had been masters of these regions for a long time.

Monsieur HENRI MARTIN. I do not believe in the so-called influence that the political supremacy of the English, in certain parts of France, might have exercised upon the population of those regions. The English, it must not be forgotten, were mainly a political authority. The armies, very small besides, that they maintained here, were principally composed of Frenchmen. It is no more accurate to believe in the presence of Spanish blood in Flanders or Franche-Comté, although Spain had for a long time been sovereign in these provinces.

The English, moreover, are only Saxons to a certain degree. Before an invasion, such as the Saxon conquest, the heads of the clan were able to slip away and disappear, but the majority of the

inhabitants remained attached to the soil and became simply colonial farmers for the conquerors.

The foundation of the English nation was Celtic, and the Saxon conquest did not at all annihilate this race. Later on, the Norman invasion introduced into Great Britain a large number of French who had intermixed with Scandinavian Normans.

THE SECRETARY GENERAL OF THE SOCIETY (Doctor PAUL TOPINARD). I second your opinion, Monsieur Martin, and would like to add this. It is not to the English that one must attribute the blond-haired people observed in Haute-Vienne, Deux-Sèvres, and Dordogne, but the blond Cymric element which, from the year 1600 B.C. up to the third or fourth century of our era, never stopped forming a current north of France down to San Sébastian towards Spain, just as they formed another one along the length of the Saône and Rhône towards Italy. The Vandals and Goths are the last of these peoples to which I have made allusion.

Doctor JACQUES BERTILLON, Sr. I might object, Doctor Bordier, to the Italian statistics, which categorize a considerable number of deaths as due to *sweating sickness*, whereas in the French statistics this cause of death category remains void quite often. However, given the information, I am certain that the Italian totals originate from the indeterminate meaning that Italian physicians have assigned to the term sweating sickness. They include under this rubric a variety of different illnesses, which present certain secondary symptoms, common to all maladies.

Doctor CHARLES LETOURNEAU. I support your observation, Doctor Bertillon. The Italian physicians of the old school conferred on the *sudamina* an importance that was totally exaggerated. With scrupulous attention they investigated its victims concerning the causative agents of their malady, and declared it an attack of sweating sickness, no matter how little detectable it was. Someone else perceived it even further in this defective way, and invented the term *latent sweating sickness*.

After this meeting Doctor Le Bon approached me and inquired about the progress of my research. I replied honestly that it was proceeding steadily, though not rapidly. He thereupon invited me to his home where, I was informed, he had some equipment that he believed could substantially simplify and speed up my work.

I accepted his invitation and went with him to his residence on rue Vignon. What he had there was a new type of camera—one which utilized the dry emulsion process in the development of photographs. The advantage of this process, Le Bon claimed, was that pictures could now be taken without the subject having to hold still for a long time. As you may recall, I had not employed cameras in my own research because of the undesirability, if not impossibility, of keeping subjects still. However, Le Bon showed me several photographs of horses in mid-stride which his camera had captured, and the images were remarkably crisp. At this point I needed little further convincing of the camera's benefits, and as a formality asked him if he would allow me to experiment with it. Naturally, he agreed.

By May 5th I had compiled a nice portfolio of photos which, in case you forgot, I brought to the Society's meeting to show you (as you were able to make it that day). You were suitably impressed, of course, but I remember that particular meeting as well for Professor Dally's talk on the causes of human degeneracy (a talk which was really a set-up between him and Doctor Lagneau). I never saw so many members enthusiastically participate in the Discussion as on this occasion, though given the topic, it was understandable. In rereading

Dally's paper after all these years, I have to say that I find Rabourdin's remarks most striking; they seem to presage Professor Kuhn's pathbreaking investigations on climatological periodicity. If by chance you happen to have any of Rabourdin's work lying around, I'd like to borrow it.

“On the Causes of Human Degeneracy”

by Professor Eugène Dally,

Past President (1875) of the Anthropology Society of Paris

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of May 5, 1881

Messieurs, it is my pleasure to submit to the Society a table summarizing the causes of human degeneracy, which I have divided into four groups.

CAUSES OF DEGENERACY

1. *Pathological*. Syphilis, scrofula, rickets, tuberculosis, leprosy, etc.
2. *Toxicological*. Alcohol, opium, ethnic poisons, intoxicants, nutritional deficiencies, pellagra.
3. *Climatic and Geographic*. Goiter and cretinism, extreme altitudes, non-acclimatization, etc.
4. *Sociological*. Urban agglomerations, ethnic intercrossings, military selections, extreme division of labor, cerebral excesses and others, etc.

Now, I must point out that I have employed the word *degeneracy* in the widest sense without any precision. The zoologists and horticulturists have voluntarily named living things which have lost qualities that a forced rearing has given them and which have returned to their natural existence as *degenerates*. It is used here in a wholly conventional sense; that is, it is rather the cultivated state, animal or plant, incapable of maintaining itself by itself, which might be considered as the result of an unnatural degeneracy. Yet while the tendency to revert to the natural state exists in the products of the animal breeders, it does not among human degenerates, who tend to self-destruction. The sense of the word is therefore very different in these two cases.

Doctor Morel is the only author who has provided a definition of degeneracy, which he has represented as *deleterious deviations of a primitive type*. I propose, instead, that degeneracy be considered as the result of *hereditary organic degradations tending to sterility*. The primitive type notion is of a remote kind, whereas in my definition the probable, though not necessarily inevitable, end of every organic decay is indicated.

One should understand that there always exist groups in decline that will become degenerates if no remedy is employed to meet the conditions of their existence.

I shall now quickly examine some of the causes that manifest themselves in these four groups. Obviously, the pathological relations which seem to exist among syphilis, tuberculosis, scrofula, and rickets must be stressed. However, I must note that the virulent maladies do not

produce all the organic degradations; syphilis and smallpox behave in this respect in an entirely different manner. As for intoxicants, it is above all alcohol which produces, in the same way as opium, hereditary impressions, whereas mineral poisons leave the descendants unscathed.

Among the sociological causes of degeneracy, urban agglomerations, whose disastrous effect is so great, stand out, so much so that certain authors, Doctor Lagneau among others, have not hesitated to attribute to their augmentation the proportional decline and end of nations. In fact, it is in the heart of such urban crowding that the most active causes of degeneracy operate with the most intensity. Based on my analyses, I believe it is necessary that at all costs we take measures to repopulate the countryside. I cannot condemn strongly enough the economic and political speculations that attract masses to our cities, the urban core of which, according to Doctor Lagneau, yields a mortality rate one fourth higher than that found in the rural areas. Now, one of the most alarming consequences of this urbanization is the depopulation of France. Undoubtedly, urbanization combines well with other causes, notably the voluntary sterility which has spread throughout Normandy, to account for our present depopulation.

As for the means we can employ to put a stop to degeneracy, I would emphasize the necessity of proper choices of marriage partners. With respect to contemporary mate selection, it is truly distressing to behold pecuniary and social circumstances being given top priority over all others.

In conclusion, I must remind you that Professor Levasseur and Jacques Bertillon have extended a cry of alarm in showing that whereas the French population constituted 38% of the European population in 1700, last year in 1880 it did not represent more than 13%.

DISCUSSION

Professor ANDRÉ SANSON (Professor of Zoology at the Sorbonne). I would like to offer a slight rectification concerning the opinion, Professor Dally, that you have seen to attribute to us zoologists. You stated that in zoology scientists consider the animals of the butcher's shop as degenerates. On the contrary, we zoologists consider such animals as perfections, and they are such, in fact, not only from the economic point of view, but also from the physiological point of view. I shall cite on this subject the work of Monsieur Regnard, professor at the agricultural college here in Paris. Monsieur Regnard, desiring to examine the blood of animals sold in the butcher's shop, told me that he expected to find their blood scantily supplied with globules. I did not at all share this viewpoint and, indeed, Monsieur Regnard found instead that the blood of fattened animals possess a relatively superior oxygen capacity. These animals are raised in the best conditions so that they can flourish anatomically, and they flourish in actuality, too. Consequently, Professor Dally, you seemed not to have appraised the opinion of zoologists in an exact way.

I also do not share your prejudices against urban agglomerations. These agglomerations are a consequence of the greater well-being that one acquires in such a setting and of the happier and better life that one leads in the big cities. Their development is therefore the result of a legitimate aspiration and is very favorable from an economic standpoint. The reasons for the depopulation of

the countryside do not come to that, and the true reasons for such will no longer exist the day when our laws, instead of being unfavorable to large families, as is the case today, become on the contrary advantageous.

Doctor LOUIS DELASIAUVE. You spoke, Professor Dally, of the diminution of the population in Normandy, because of voluntary sterility. This progressive reduction of inhabitants is real. In the department of Eure, especially, it has been evidenced in a series of reports prepared by Doctor Fortin of Evreux, Secretary of the department's Board of Hygiene. This honorable gentleman early on reveals his sense of foreboding over Normandy's population decrease, without indicating precisely the cause. From year to year, after 1848, the gradual discarding of the total population, which was initially 430,090 inhabitants, has proceeded to where, in the latest census, it has now fallen to 376,000. In 1830, births rose to 9,343; in 1832, to 8,690; in 1853 they were only 8,146, and in 1854, but 7,938, even though the number of marriages had little changed (1830--3,770; 1853--3,418; 1854--3,430). The latter should have been higher, because 1830 was an exceptional year for births; but, marriages only amounted to 2,932 in 1832 and 2,312 in 1834.

Normandy's voluntary sterility is therefore unquestionable. But, most strikingly, it coincides with a perceptible decline in territorial revenues. Large farms rent themselves out with difficulty: tenders exceed the demand. Is this concurrent surplus farmland situation something to which we must attribute the population decline? Certainly it is responsible for a good part of it. However, there are other contributory causes that must be invoked. The desire for comforts is satisfied proportionately to the limitation of the number of children. One wishes the same life for his offspring as for himself--being comfortable, having a house, plenty of food, money for marriage, and relative wealth. As for the farm harvests, notwithstanding certain foreign imports, they have been at least equivalent to those gathered in the old days, and generally even provide an excess yield and greater return. Are such harvests curbed as expenses increase? Yes, perhaps, if the aforementioned will not result in the farm hands' salaries being raised and the price of livestock doubling. One can therefore explain the reduction of farms in Normandy as being an indispensable element in the total of benefits for the region's inhabitants.

Doctor GUSTAVE LAGNEAU. Professor Dally has just highlighted the bad state of our urban populations. In order to better appreciate the noxious influence of urban living conditions, it is necessary to note that in the large cities the ratio of adults is often much higher than in the countryside, because of the substantial numbers of young townsfolk sent out to the countryside to be brought up, and the immigration into the cities from the countryside of many rural adults.

Now the adults, proportionally more numerous in the cities, are at the procreative age and possess a slight mortality. The population of the cities will therefore seemingly present a considerable birth rate and a minimal death rate. However, on the one hand, if, instead of reporting the births to inhabitants of all age groups, one only reports births to adults falling in the prime reproductive age range, the birth rate is found to be not any higher than that of the countryside; and one will also discover that the urban birth rate is much more frequently comprised of illegitimate births. Further, in our present social state, illegitimacy nearly doubles infant mortality.¹

On the other hand, if one studies the mortality rate for all ages, one ascertains that for almost all age groups the mortality rate is substantially higher in the large urban agglomerations, like Paris,

than in the countryside.²

With regard to aggravating causes of mortality within our large cities, though without wishing to discuss here typhoid fever and other diverse causes of death, I shall briefly review how phthisis cruelly deals with those countrypeople who come to the cities to devote themselves to sedentary occupations. Monsieur Chatin, of Lyon, has pointed out with what frightful rapidity the young Savoyards who come to his city to take a job as a winder are attacked by this ailment.³ Quite recently, Doctor Ruelle, a member of the Commission of Hygiene of the nineteenth arrondissement of Paris, stated with respect to phthisis: "Among all these adults who arrive to us full of health, how many you find who have moved into a small or unventilated dwelling, and are soon and without fail struck by the malady!" I shall add, just as Doctor Gouraud has,⁴ that I have been persuaded to point out that this morbid influence of the urban habitat primarily affects immigrants arriving from the mountain districts.⁵

With respect to the low birth rate of our Normandy populations, of which you have spoken, Doctor Delasiauve, I believe that it is entirely due to social conditions, and not from a degenerative process or a physiologic inaptitude. Our Normans are descended, on the one hand, from the ancient Celto-Gallic people who occupied the region during the Roman and Frankish eras, and, on the other hand, from Scandinavians who began settling Normandy around the close of the ninth century. Now, these latter settlers made light amongst themselves with a remarkable fecundity, as attested anyhow by Jornandès, historian of the ancient Goths who left Scandia, as well as by Robert Wace, Dudon de Saint-Quentin and Guillaume de Jumièges, historians of the *Northman* invaders of our Neustria.⁶ In order to convince oneself that the low birth rate of our present-day Normans has to do with a voluntary restriction, it is sufficient to note that our Normans today still display a considerable fertility, like the other peoples of the North Germanic race, or Teutons, which statistical research performed by Doctor Bertillon, Sr. has plainly revealed.⁷ Our Normans frolic with one another with the fullness of the generative faculties; and, if they voluntarily limit the number of conceptions, they cannot prevent that among these conceptions the proportion of multiple pregnancies remains fairly large.

Now, Professor Sanson thinks that certain new laws might be able to generate a higher birth rate and, by consequence, an increase in our population. In general, one avoids procreating, or limits the number of offspring, in order that one can assure as much as possible his children a social situation at least as favorable as that which he himself enjoys. Clearly, any legislation that creates an obstacle to marriage restrains the legitimate birth rate; by contrast, any measure that works towards improving the means of existence and people's prospects or careers may increase the birth rate. However, as the necessary measures and laws are often difficult to determine, it can only be of great utility to have them indicated.

Monsieur LUCIEN RABOURDIN. I request permission to make just a few remarks from the economic point of view, an area in which I am most especially engaged. It seems to me, Professor Dally, that you are alarmed more than is reasonable by the apparent depopulation of France.

If one attentively studies the population growth curve, one will note that this curve is periodic. It is, among other things, composed of a set of oscillations that shows in turn the slow and

rapid increases in population. We have experienced a slow period of growth since around 1847, but the curve is already rising again and we are now entering the following period: one of rapid growth.

Monsieur LIONEL BONNEMÈRE. Professor Dally, you say that one of the best means to employ in order to put a stop to the depopulation of the countryside is to render the life of our peasantry more attractive. Obviously, this improvement would prove useful, but I do not think that a more attractive life will suffice in order to retain the inhabitants of our rural areas within the places of their birth. I believe that the key to determining the cause of the diminution of the population can be found by investigating the same manner of farming in use in certain regions.

In the part of Maine-et-Loire that is called *Bocage Vendéen*, where the peasants are not landowners but cultivate small farms, the number of children is considerable. In effect, hirelings are expensive; so, numerous children constitute wealth. Along the banks of the Loire, by contrast, in the arrondissements of Angers and Saumur, the peasant is a landowner: there are hardly any children. For in reality, a man who possesses 1 or 2 hectares and who, thanks to the cultivation of this small property, is happy, above all if his land is a vineyard, will bequeath poverty to his children, who in afteryears will be forced to place themselves in the service of others. That is not what one will see in Anjou.

Now, this same phenomenon which I have just described can be observed in many other regions of the West.

Therefore the conditions of farming should perhaps be modified. But, for various reasons, a discussion on this point will not fall within the circle of studies of our Society.

Doctor COUDEREAU. I shall first make a remark on the subject of degeneracy. It appears to me, Professor Dally, that in the case of farm animals you have not sufficiently distinguished a fatty degeneracy from a fattening, and this is perhaps the reason why you are not in agreement with Professor Sanson.

With regard to the causes of the depopulation, I think that the genre of religion is not entirely unconnected.

Among Protestants, a limitation of the number of children exists less than it does among the Catholics. Among the latter, they regard work as a punishment of God, and endeavor as much as possible to exonerate the children. Among Protestants, on the other hand, with the English, for example, they consider work as the means to creating wealth, and children are trained to migrate far and wide if necessary in order to gain wealth by their labor.

Madame CLÉMENCE FOYER. It seems to me that by investigating ways to counteract the depopulation trend in France one is dealing with an issue that is only tangential to the question posed by Professor Dally. The question calls for researching what the causes are of the degeneracy of our species. Now, these causes do not seem to me to be pathological, but rather social, and these social causes appear to me to produce effects whose importance is incontestable. Whatever might be the accuracy of your observations, Monsieur Roubourdin, it is nonetheless true that the relative

depopulation of France is an incontrovertible fact, because we now only represent 1/33rd of the European population instead of the 1/13th that we had formerly been. There is a real danger here if we do not watch out; because while our race becomes more abated, other races are increasing with a disquieting rapidity. The yellow race, for example, which projects itself in all directions and above all extends throughout America, will end up by acquiring worldwide predominance. I believe that there is only one effective remedy against this danger. I am ever more conscious of the need to restore morality upon positive bases, and have come to comprehend the necessity of introducing morality into education. Now, with any scientifically established morality, it is necessary to determine and explain the duties of the individual versus the species. The idea of and belief in these duties therefore ought to be inculcated by educators, and all the proposed remedies to combat the difficulty in question will continue to remain ineffective, as long as they have not at all seen to it that this first principle of general morality regarding duties is entered into the conscience of each person.

Monsieur GABRIEL DE MORTILLET. Regarding the causes of our depopulation, Doctor Coudereau a few minutes ago made a comparison between Catholics of one nation with Protestants of another. This is not the way you should have proceeded, Doctor Coudereau. What one needs to do is to compare the results produced by each religion under identical circumstances. Now, if one compares the Catholics and Protestants in those countries where they live side by side, one invariably finds that the Protestants have fewer children than the Catholics.

Doctor GUSTAVE LAGNEAU. I also do not believe, Doctor Coudereau, that you can attribute to the Catholic religion, compared to the Protestant religion, the restrictive influence that is currently acting on the birth rate. Two of our old provinces, both equally Catholic, and bordering one another, present a notably different birth rate. In Normandy, the birth rate is so sufficiently weak that it is surpassed by the death rate; by contrast, in Brittany the birth rate is considerable.

The PRESIDENT of the Society (Doctor THULIÉ). I see that there are yet several members who have requested to speak. However, as the hour is advanced and because other members still desire to take part in this most important discussion, I shall carry it over, if the Society does not object, to the next meeting.

It now being 6:15, the meeting is hereby adjourned.

FOOTNOTES

1. Gustave Lagneau, *De l' influence de illégitimité sur la mortalité* (*Ann. d'hygiène*, t. XLIV et XLV, 1875-1876).
2. Gustave Lagneau, *Etude de statistique anthropologic sur la population parisienne* (*Ann. d'hygiène*, t. XXXI, 1868).
3. Chatin, *De la phthisis des tisseurs et des dévideuses à l'hôpital de la Croix-Rousse*, 1867, p. 15, and extract in *Lyon médical*, 1869, and *Gaz. hebd. de méd. et therap.*, 23 July 1869, p. 480.
4. H. Gouraud, *De l' action des différents climate dans le traitement de la phthisis pulmonaire* (*Union médicale*, 28 November 1872, and *Bulletin de la Soc. méd. d'émulation*, 9 November 1872 and 7 March 1874).
5. Gustave Lagneau, *Des mesures d'hygiène publique propres à diminuer la fréquence de la phthisis* (*Ann. d'hygiène*, t. XLIX, 1878).
6. Jornandès, *De Getarum sive Gothorum origine*, cap. III, p. 427, coll, Nisard. -- Robert Wace, *le Roman de Rou*, t. I, p. 38, no. 774, 1827. -- Dudon de Saint-Quentin, *Hist. norm. scriptor.*, p. 62, 1619. -- Wilhelm Gumenticensis, *ibid.*
7. Jacques Bertillon, *Démographie de la Seine-Inférieure* (*Assoc. pour l'avanc. des sciences*, session in Havre, 1877, p. 749).

A couple of weeks later Le Bon asked me to accompany him as his assistant on a research expedition to the Tatra mountains in Poland. Specifically, I was to serve in the role of photographer and, as you know, I accepted his offer. We left soon thereafter. In hindsight, I see that what Le Bon really had in mind by loaning me his camera months before was to train me adequately enough so that I could be his photographer for this mission, and relieve him of the chore. Regardless of his motives, it worked out extremely well for both Le Bon and me, didn't it? His "On the Present Formation of a Race in the Tatra Mountains," complete with all the photos I took, was published in the March 18, 1882 *Revue Scientifique*, and nearly won him an award from the Society (I still have a copy, if you no longer have yours). As for me, not only did my career greatly advance as a result of my participation in Le Bon's project, but another direct effect of all this was my introduction to the timely largesse of Madame Brouardel.

Between my journey to the Tatra and your own commitments, we were unable to make connections again until late October. I recall when we finally got together how captivated you were by my stories about the people and topography of the Tatra mountains, and you could hardly wait for the November 3rd Society meeting so that you could buttonhole Le Bon and hear his versions.

Come November 3rd, I remember there being some annoying problem with one of the carriage wheels on the way to the meeting. Somehow we repaired it and managed to arrive at our destination on time.

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Well, besides hearing Le Bon's discourses about the Tatra mountainfolk, you got in on a rare bonus. Lev Mechnikov was the guest speaker (for the first and only time, I believe). His conjectures concerning Japanese origins were fascinating. Even better was when Professor de Quatrefages offered his insights (I always loved that man's lectures). In my estimation, the level of the Discussion period seemed to have reached a new high for the Society that day; Le Bon himself felt compelled to participate. See if my judgment on this accords with your own.

“Concerning Japanese Origins”

by Lev Il'ich Mechnikov

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of November 3, 1881

From the very first days of my sojourn in Japan I had been impressed by the tropical nature of certain customs and habits of the islanders inhabiting the Land of the Rising Sun: habits and customs which are not much in harmony with the land in which they live. In this manner, notwithstanding the Chinese influences to which the architecture of Japan has submitted, Japanese houses and cottages involuntarily summon up the memory of the much more primitive dwellings of the Dayaks of Borneo. The disposition that the Japanese, especially those belonging to the lower classes, have of doing without clothes during the summer season, a disposition which the current government combats with decrees and regulations enforced by the police, cannot be native to a land where, though its latitudes mostly fall below those of Gibraltar and Syracuse, one encounters the temperatures of northern Italy and northern France: it clearly seems to me to be a reminiscence of a prehistoric period whose seat of action was some tropical island region or area on continental Asia. Furthermore, the practice of tattooing is developed to such an extent that it makes one presume that the ancestors of the Japanese were in the habit of being scantily clad, and the example of the Japanese on this matter may serve as new evidence supporting the thesis advanced by several distinguished ethnologists, namely: that tattooing is a custom of the naked man. The upper classes of Japan, who have for centuries dressed in a manner similar to that of the continental peoples of eastern Asia, had abandoned the practice of tattooing themselves well before today's reform-minded government had thought about prohibiting it; but, the running footmen, who pull small carriages and take the place of hackney-coaches in the streets and on the roadways of the Empire of the Rising Sun--in a word, those individuals whose profession obliges them to be seen naked in public still appear to this day completely covered with arabesques and drawings, from the chest down to the knees. All these considerations, combined with the well-known fact that the Japanese language is only superficially connected to the group of idioms of continental Asia, seem to me to indicate with sufficient clarity that our Orientalists have gone astray in representing to us the nationality of the Land of the Rising Sun as an appendage of the great Chinese nation, more or less modified by Ainu influences.

Since Kaempfer, travellers to Japan have unanimously recognized that the Japanese nation does not have a visible quality of ethnic homogeneity. Dickson, the Englishman, appears to me to be the one who has most successfully traced the two extreme types between which they oscillate, that is to say, the entire Japanese physiognomy. There is the well-known type, possessing prominent cheekbones, square face, and flat nose, on the one hand; on the other, there is a less known type that possesses a dolichocephalic skull, head shaped like an elongated oval, projecting nose that is quasi-aquiline, and a quite overwhelming alveolar-subnasal prognathism. This same author has observed with good reason that this type, which I shall call the *Malayo-Polynesian* type, faithfully represented in Japanese prints, is manifestly linked to the idea that the Japanese form the most noble race, a race of distinction and beauty; whereas the type with the prominent cheekbones, or that which people commonly call the *Mongol* type, is the plebeian or vulgar type depicted in Japanese prints. I shall add that I have not often encountered in Japan living representatives of the aristocratic type in

all its purity; whereas it is certainly the dominant type in a large part of the former kingdom of Ryukyu (or Luchu). Throughout the Land of the Rising Sun the most perfect representatives of the Malayo-Polynesian type will be, in my opinion, members of the Shimazu family, princes of Satsuma.

The chronicles of Japan inform us that in 660 B.C. the kingdom of Yamato (which subsequently became the Japanese Empire) was founded, in the central part of the large island, by a conqueror that we have come to know under the Chinese pseudonym Jimmu Tenno (Divine Warrior). I believe I have pointed out in my book, *L'empire japonais* (1878), that this pseudonym, in the same way as all the deification titles of the emperors of Japan, was only invented much later, in the image of the posthumous titles of the Chinese emperors. The national name under which this founder of the Japanese dynasty is mentioned in the *Kojiki* (Records of Ancient Matters), the most ancient document on Japanese history that has made its way to our times, is Kami Yamato Ihare-biko; but, above all when it comes to Japan, such names are unable to furnish us any indication about the provenance of this hero nor about the nationality of the enemies against whom he made battle.

Tradition tells us that the founder of the Japanese Empire was a more or less direct descendant of "the Goddess who brightens the sky" (Amaterasu); that his ancestors inhabited the "highest valley in heaven" (Takamagahara) until a time came when the great-grandfather of the fifth generation of heroes in question deigned to descend to Takatriho, which is the name of one of the summits of the volcanic massif of Kirishima, located in the southwest part of the island of Kyushu. It must be observed that this particular spot of Japanese territory, by its geographical position, is inaccessible to settlers from the Asian mainland who have always followed a well-known route: from Korea across the Strait of Tsushima, landing along the northwest coast of Kyushu, especially at the bay which today still bears the characteristic name of *Kara tomari* (harbor of the Chinese). The above-mentioned heroes, on the contrary, moved along the eastern seaboard of Kyushu, then passed through the Inland Sea until reaching the gulf of Osaka, at which point they disembarked in order to venture into the interior. In this manner the route known to be taken by the creators of the Japanese Empire strictly coincides with the Kuroshio, the great "black current" of the Pacific Ocean. It seems to me quite permissible to conjecture that in order to reach the Yamato Plain the ancestors of Jimmu would have done like him, that is to say, after leaving Formosa they had been led hither by this same black current, aided probably by winds from the southwest, which regularly blow in these waters during the summer monsoons. By accepting this hypothesis, one can easily conceive how the Malayo-Polynesian type, entirely distinct from the Mongol and Ainu, is attached in the representation of Japanese to the idea of aristocracy, nobility, and conquest.

As for those elements of the Japanese nationality gained through conquest, local historical accounts are very explicit and are not lost in conjectures. They disclose to us that there were in ancient times two species of barbarians living in the archipelago of the Rising Sun: the barbarians of the West, or *Kumaso* (troop of bears), identical to the populations who have figured under this same name in the ancient history of Korea, and the hairy barbarians of the East, the *Yemisi*, the name people in Japan bestow today upon the Ainu of the northern islands. I have recounted in my book as to how the Kumaso, vanquished by the descendant of the "Goddess who brightens the sky" (whereas their kings had descended from the Wind Spirit), retired to the province of Izumo, where they established a kingdom that the Japanese designated with the name of *Néno-Kouni* (land of roots),

because it harbored the grains of the "five cereals," whose cultivation formed the base of the Empire's national wealth. This kingdom maintained its independence up to the 2nd Century A.D. It was only after Prince Yamato-takeru had pacified these barbarians of Izumo that the Japanese risked invading Korea, where they made their first conquest under the Empress Jingō, the Semiramis of the Far East, who the Chinese annals have mentioned by name as *Pimiku*. But here we fall into the domain of history.

I shall therefore pause for now, though I should mention that the struggle the Japanese engaged in with the Ainus, their *Drang nach Osten*, did not commence until much later. Accordingly, it must be supposed that at the time when some unknown subdivisions of Malayo-Polynesian tribes proceeded to establish the kingdom of Yamato in the center of Japan's large island, they had conquered earlier the Kumaso of Korea, having already exterminated or expelled the Ainus from this part of their territory.

DISCUSSION

Professor JEAN LOUIS ARMAND DE QUATREFAGES. I have listened with keen interest to your presentation, Monsieur Mechnikov. The points you raise support the opinions that I have professed for a long time, and you have made them at a time when the opinions universally embraced with respect to the Japanese populations are substantially different from those that I have believed necessary to adopt. This leads me to offer some observations.

The English have been neither the first nor the only ones to regard the Japanese as being ethnically comprised of different types. Taking into account the facts that Kaempfer and Sieboldt have uncovered, I have for a long time entertained this opinion. I have distinguished three ethnic stocks in Japan that I have been able to attribute to the three fundamental types of human races: the black, the yellow and the white. Furthermore, I have shown that in Japan these types are more juxtaposed than blended.

For over five years I have expounded in my lectures and treatises these estimations and the facts upon which they rest. Indeed, I have briefly summarized them on various occasions in several publications, among others in a very detailed Introduction to a *Histoire générale des races humaines*, a large publishing project intended by Monsieur Duvergier, Sr., but which has not yet been realized.

In my *Rapport sur les progrès de l'anthropologie en France* (1867), the Japanese appear as an example of *races with anthropological elements juxtaposed* in the table listing large mixed races connected more or less to the yellow parent-stock.

Years later, after my report's publication, Monsieur Vivien de Saint-Martin, in insisting upon the existence of a white component in the Far East, became reconciled to my point of view.

Most recently Monsieur Guimet, on his return from his journey to Japan, repeated that the population is a mixture and presents to a high degree the juxtaposition of types.

Different foreign publications have more and more confirmed what I have said on this

subject. Above all, the descriptions and engravings of Messieurs Fah and Green appearing in the account of the American expedition made under the command of Commodore Perry can be cited.

The observations of Monsieur Mechnikov have come once again to the support of the conclusions that result from the preceding facts.

In a paper on the Negritos, published in the first volume of the *Revue d'anthropologie* (1872), I demonstrated that a Japanese skull from Doctor Broca's collection displays the essential characteristics of the Negrito race attenuated only by cross-breeding. This anatomical fact, which is in agreement with the details provided by the aforementioned authors of old, establishes beyond any doubt the ancient existence in Japan of a Negro element. However, this element seems to be the most attenuated and diluted of all. I must note, though, that it appears less effaced or inconspicuous in the archipelago of Luchu, judging from some of the details furnished by Basil Hall and his travel companions.

Monsieur Mechnikov allows for the introduction of the yellow element into Japan, at least in two different epoques, of which one occurred prior to the arrival of the Chinese in these islands. This course of events is possible; but, in any case, we know that at the time when Japan wanted from China its scholars and other aspects of civilization, a great migration took place, and traces of Chinese blood naturally found their way into the population. The portraits gathered by Messieurs Fah and Green, and from what we are often able to verify by ourselves, cannot leave any doubt in this regard.

But the same means of investigation reveal no less surely the presence of a white element. This element sometimes appears in a remarkably pure form. However, I do not regard this characteristic as being present in the picture of the prince of Satsuma, which you have shared with us, Monsieur Mechnikov. With him, his oblique eyes and thick lips signify a Chinese mixture. To whatever degree that one may be able to pass judgment from a photograph, there is no question that the likeness it shows can be understood to be very changeable.

The pure white type finds itself much better expressed in the third ambassador to head the Japanese embassy in Paris. In this case, all the traits are those of a white man; and, in particular, the eyes are perfectly horizontal, the lips thin and quite mobile. I must add that, by the vivacity and grace of his manners, this yellow man, belonging to one of the oldest families of Japan, completely calls to mind what we have been told about the noblemen of last century.

The existence of three types being an established fact, one must ask himself from where they may have come before arriving in Japan.

Regarding the black element, we know without any doubt that the large Negrito formation stretches from the Andamans up to the extremities of the territory of the Malay archipelagos. We find it again in Luchu. There is nothing easier than to see it managing to reach Japan.

We have witnessed how history, relatively recent, is sufficient to explain the presence in Japan of the yellow element.

As for the white element found in Japan, it is of two kinds.

The Ainus have been the earliest representatives of this element in Japan. They formerly occupied a much more extensive area than they do now. It is perhaps to this type that the pithecomorphic men observed in Sumatra by Rienzi are connected. In any case, it is evident that they were dominant in Japan. The physician to the previously mentioned Japanese embassy, a man who I have been able to chat with thanks to the intermediation of Monsieur de Rosny, did not hesitate to affirm that they had in former times occupied the entire archipelago. One of our navy doctors, whose name I most regretfully have forgotten, told me recently that he had seen pure or half-bred Ainus all along the northwest coast of Japan. On the other hand, this white element can be met with and still probably exists substantially unmixed in the south of Japan. Indeed, in a published memoir (*Voyages de Moncatch Apé*, annotated by myself), I have shown that this race extends all the way to Luchu. In this manner one can explain the presence in these islands and in Japan of men remarkable for their light complexion and well-developed beard, as noted by various travellers.

But another vastly different element, although likewise white, has come to mingle with the preceding. It is the one which, departing from Borneo and neighboring islands to conquer all of Polynesia to the east, is widely distributed throughout various Pacific islands and archipelagos: it has been encountered in the Philippines, most notably in Mindanao by Doctor Montano. It is to this type, whose skin is always quite smooth and hairless, that I attribute the superior types that I have earlier discussed. Most likely it is this white element which, under the command of Jimmu, carried out the conquest of Japan, defeating the Ainus.

This conqueror, Jimmu, was certainly a foreigner. Some have claimed that he came from China. This is undoubtedly an error. The white origins of this warrior and his companions is attested by the physical qualities of their descendants. It is only pretension that has Jimmu being descended from two terrestrials on his father's side, and two gods of the sea on his mother's. Such a divine origin has never been assigned to any Chinese person. By contrast, we know that the Polynesian chiefs, even today, affirm that they are not only sons of gods, but are gods themselves.

Now, Monsieur Mechnikov, you have backed up several of your opinions concerning the interpretation of the mythological legends of Japan; but I have to remark that with Jimmu we fully enter, in reality, historical times. The conquest of the Japanese archipelago by this warrior and his companions were not lost in the darkness of time, inasmuch as it took place about the middle of the 7th Century B.C. (667 B.C., according to Monsieur de Jancigny).

To summarize, I have demonstrated today that the Japanese population is comprised of:

- 1) A black element of the Negrito type, nowadays probably close to being entirely blended into the general population.
- 2) A yellow element from all appearances coming mainly from China, and it is always well recognizable.
- 3) A white Ainu element, representing the population which occupied the archipelago at the time of the conquest.

4) A white Indonesian element, which effectuated this conquest and can still sometimes be found in a state of purity, above all among members of the ancient nobility.

I must add that the yellow and white elements occasionally occur juxtaposed and not intermixed in any striking manner. The portraits emanating from the American expedition cannot leave any doubt in this regard.

Doctor ARTHUR BORDIER. The pathological idiosyncrasies of the Japanese race happen to support the arguments invoked by Monsieur Mechnikov and Professor de Quatrefages so as to prove the threefold origins of this population. No other population can better demonstrate the importance (till now much too unrecognized) of pathological analysis in order to characterize races. The Japanese are a melange of three types: white, yellow and black. Now, their pathology displays the effects of this triple influence.

For example, syphilis, although it very often strikes the Chinese, does not cause much havoc with them. It is, on the contrary, a very grave affliction with the Japanese; one observes likewise its seriousness among the Malays and the black races. The grave results that the Japanese experience with syphilis is a hallmark of a race composed of Malays and black elements.

Now, a high frequency of phthisis is predominately a negroid characteristic. It is the same with cholera: while the yellow race is rarely struck by this malady, it always inflicts more ravages among the blacks. The Japanese are also more subject to cholera, and with them it creates a condition of utmost gravity; on this point the Japanese resemble the Malayo-Polynesians.

Monsieur LEV MECHNIKOV. For my own part I have described how frequent phthisis is among the Japanese. Without hazarding a medical discussion which oversteps my competence, I wonder if this disposition to incur phthisis indicates that their lungs are not adapted to the climate of their country.

Doctor ERNEST HAMY. I am disposed, Monsieur Mechnikov, to believe that the practice of wearing tattoos must have been borrowed by the Japanese from the Ainus. Moreover, are there not affinities between the Japanese tattooing and that which is in common use on both shores of the Bering Strait?

Niedendorf, in his work on the Siberian peoples, states that they engage in tattooing and in particular decorate the face with a design that runs from the corner of the mouth to the outer angle of the eyelids. Now, certain diggings executed by Monsieur Pinart demonstrate that this practice likewise permeated the Aleutian Islands; one sees in his collection a mask that bears this kind of ornamentation.

Tattooing is therefore also a northern custom.

Monsieur LEV MECHNIKOV. I do not attribute great importance to the parenthetical remarks that I broached initially concerning the origins of tattooing in Japan. The arabesques that the Ainu women tattoo on themselves can be found as well among Japanese women, but these resemblances in ornamentation do not prove a common origin, because these embellishments are

I therefore request you, Monsieur Mechnikov, to tell us if you think that the revolution attempted by the sovereign of Japan for the sake of transforming the manners, customs, and civilization of his country is likely, after his departure, to leave behind new, durable institutions.

Monsieur LEV MECHNIKOV. This revolution is less sudden than you have deemed, Professor Dally. Already by the 17th Century Japan was in the process of turning into a European state.

The revolution with which we are assisting today is only the natural fruit of the ideas of civilization that for a long time already possessed deep roots in Japan.

The Japanese take to these ideas most remarkably. For example, it is known that the Russians, who for three centuries have already occupied part of the Far East, avail themselves of Japan as if it were a center of civilization. If a Russian ship finds itself damaged and experiencing some serious difficulties in Northeast Asian waters, it is to a Japanese port that it will seek out repairs. It is true that the Japanese have borrowed from French engineers and others the technical knowledge which they presently possess, but they have sufficiently mastered it so as to be able to henceforth do without the guidance and direction of European engineers.

Professor EUGÈNE DALLY. I cannot believe, Monsieur Mechnikov, that the instruction provided by the Jesuits in Japan during the 17th Century produced in this country deep roots of European civilization.

Their influence has only been of brief duration. It does not explain the sudden establishment in Japan of the French Civil Code, nor the strict governmental regulation of how people can dress, an example of which is the stipulation that a frock-coat in the French fashion must be worn during official ceremonies.

There is no historical precedent indicating that such an abrupt and complete revolution has ever been durable.

Monsieur GIRARD DE RIALLE. I must disagree with you, Professor Dally. Yes, this precedent exists, and we find it in the history of Japan itself, when the Chinese abruptly introduced their civilization into the islands of the Orient.

Doctor GUSTAVE LE BON. I entirely share the ideas that you have proffered, Professor Dally, and consider that trying to impose on a people who have attained a fixed evolutionary level a civilization belonging to an entirely different stage of evolution is just as impossible as compelling an aquatic animal to breathe air before it has had time to develop gills. There is no example in history where a superior race has succeeded in imposing its civilization upon a race intellectually situated a great distance below it. Two peoples occupying neighboring phases of evolution, the Chinese and Japanese, for example, can reciprocally influence each other, but it will be altogether otherwise if these peoples prove to be at very different evolutionary stages. Japan exemplifies precisely this latter situation. Attempting to force on an entirely feudalistic people a Code adapted to the needs of very different peoples, in a word, to impose institutions which oblige them to completely break with their past, this is to ignore the most fundamental laws of the evolution of

societies and to prepare the people upon whom this experiment is performed for an extremely painful and sad future. I have had occasion to research the case of Japan, and in my work: *l'Homme et les Sociétés, leurs Origines et leur Histoire*, I have presented it as an example typifying the results that can emanate from the ignorance of certain fundamental sociological laws.

Monsieur LEV MECHNIKOV. You must not take too seriously the introduction of the Civil Code in Japan, Doctor Le Bon. Its use is not obligatory. However much it has been adopted officially, it is in place mainly for the sake of accommodating the motives of foreign politics. The Japanese are afraid of the interference of the consuls in the dealings that they have with Europeans, and have desired to put in the way of any attempts at foreign intervention the existence of a European Code in their land.

A couple of minutes ago Monsieur de Rialle noted the abrupt transition which might have occurred in Japan during the time period spanning the last-appearing mythological stories and earliest historical accounts. I have not found this transition to be as abrupt and sudden as you have contended, Monsieur de Rialle. However, there is a reason why history followed all at once after the legends: it was the introduction of writing and that of the Chinese practice of recording and maintaining annals of countries. This practice was ushered in very late. Accordingly, the history of Japan is in arrears by eleven centuries over that of other peoples. It is up to us to restore it for our own improvement, and to accomplish this anthropology can be of great assistance to us.

"So," you ask, "what else happened that I should know about?" Definitely the following. By mid-November you were totally bedridden by the same type of catarrhal malady that so often favored me, and therefore missed out on quite a meeting on the 17th. Le Bon took center stage for a while. Using as an illustration his photographs taken of the Fuegians then housed at the Jardin d'Acclimatation, he gave a brief talk on the advantages of the dry emulsion process. I wouldn't bet that 100% of the members were really that interested in what he had to say, but the talk served a second, more important purpose—once again, another prearrangement—acting as a perfect buildup to the main speaker's presentation.

Léonce Manowrier, only five years our senior, was the featured presenter. It was his debut as a speaker before the Society, and he delivered a sensational report, "The Fuegians of the Jardin d'Acclimatation," that was as extraordinary for the quantity of its detailed measurements as for its vivid portrayal of a pitiful people. ("Wasn't he brilliant!" old Doctor Bertillon exclaimed to me afterwards.)

Now, the Discussion period lasted even longer than Manowrier's rather extended remarks, thanks in no small part to Doctor Topinard who allowed his blowhard nature free rein. Be that as it may, the Discussion participants provided plenty of entertaining moments. I got a big chuckle out of Paul Nicole's gibes, as they corresponded with some of my own sentiments. You will discover, in reading this paper, that Bordier produced the best line of the day, a witticism possessing double-entendre overtones that made Topinard appear ridiculous (much to the satisfaction of many, as you

can imagine). As a matter of fact, the entire Discussion was characterized by participants going at each other's throats. Very amusing. I should mention that Korelacque, who was unfairly put down by Topinard, at least got in the last word—one that, I'm certain, you would second.

“On the Applications of Photography to Anthropology With Respect to the Photographs Taken of the Fuegians Housed at the Jardin d'Acclimatation”

by Doctor Gustave Le Bon

ANTHROPOLOGY SOCIETY OF PARIS
Meeting of November 17, 1881

I have the honor of offering to the Anthropology Society copies of several photographs of the Fuegians currently housed here in Paris at the *Jardin d'Acclimatation*; these pictures were taken with the assistance of my friend, Monsieur Jeanmaire. The subjects are reproduced both in profile and in full face, and attached to each picture is a scale consisting of a strip of paper 1 decimeter in length, which permits one to reconstitute the dimensions of all parts of the body and to execute by consequence on these photographs the same measurements that one is able to carry out upon the living.

Because of the impossibility of getting these individuals to remain absolutely still, their reproduction by the old methods of photography would have been extremely laborious. In fact, a professional photographer who preceded us was obliged to return for five consecutive days, recommencing his operations non-stop for six hours each day. By using a dry emulsion of gelatino-silver bromide, which the latest method of photography calls for, we were able to operate in an instantaneous manner, and therefore did not have to preoccupy ourselves with trying to keep the subjects still. Also, our savages have been caught in the most diverse, but at the same time the most natural, poses. Two infants, of whom one sees only their heads emerging from the blanket wrappings where they are taking refuge, have a very curious physiognomic expression. One of them, who I was annoying a few moments before, kept on crying.

From an aesthetic point of view, these photographs are perhaps not as good as those of the Nubians that I took last year. But, from the photographic point of view their clearness is complete. We were able to enlarge them considerably, and I expect to show you in an upcoming meeting a print possessing very large dimensions.

In closing, I must bring to the attention of the Society the importance of the services that can be rendered to anthropology by the new advances realized in photography lately. With the old wet or dry methods, so slow formerly, taking photographs while travelling or conducting fieldwork was very impractical. However, with the new gelatino-silver bromide process, it has become quite an easy thing to do. The equipment that we employed for photographing the Fuegians has the volume of a large dictionary. That which I have taken with me on one of my recent trips and which sustained no damage over the course of 5,000 miles can be kept, with all its accessories, in a small valise. There are few anthropometric measuring devices that are less voluminous, and I do not know of any anthropometric measurements which can furnish as much information as a good photograph that is provided with a scale. It is therefore desirable that the Anthropology Society recommend the employment of photography in its *Instructions* and also make it the subject of a special instruction.

This instruction is so much the more necessary, being as the majority of the photographs that one meets with in our trade do not furnish useful data from the anthropological point of view, and given that just a few rules will suffice in order to render them, on the contrary, most useful. I must add that photographic plates prepared in advance will last for a very long time and also that, by employing extremely simple methods, one can confer on them any sort of sensitivity. For example, here you see pictures that were taken in four seconds in the interior of a room during a dark day. One may even, in what might only possess a completely theoretical interest, prepare silver bromide to such a degree of sensitivity that it can serve to photograph an object in a room where to the eye this same object remains in total obscurity. Prepared in certain ways silver bromide is, in fact, sensitive to the spectrum's infrared rays which are totally invisible to the eye. If then, through the medium of a prism, one only allows to enter into a room the rays that exist outside of the visible part of the spectrum, the room will be entirely dark to us, and yet one might be able to photograph here some object. In actual practice one contents himself to supply the silver bromide with a sufficient sensitivity so as to produce in sunlit conditions instantaneous images, which permits one to capture all possible facial expressions and to easily photograph, for example, a galloping horse. Above all, one may photograph an individual who is otherwise fearful or suspicious, and from the photographic point of view it perhaps is most useful in taking pictures of individuals belonging to inferior races.

DISCUSSION

The SECRETARY GENERAL of the Society (Doctor Paul Topinard). The *Instructions* have recommended for a long time the employment of photography. One should not imagine, however, that photographs can replace good measurements and accurate descriptions, which evidence the shapes that present themselves to us. Even given the most correctly taken photograph (in conformance with prescribed scientific rules), it will always display a central projection with all its illusions.

“The Fuegians of the Jardin d'Acclimatation”

by Doctor Léonce Manouvrier

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of November 17, 1881

Last September Monsieur Geoffroy Saint-Hilaire, director of the Jardin d'Acclimatation, apprised the Anthropology Society of the arrival of several inhabitants of Tierra del Fuego and invited a commission to come examine them. Inasmuch as the Society was in recess at that moment and the members of the special commission were absent from Paris, I requested from Monsieur Saint-Hilaire, in concert with my colleague Monsieur Chudzinski, permission to serve as replacements, and this permission was graciously accorded to us. I made the first visit to the Fuegians with my colleague, but a slight illness prevented him from returning the following days. As it was impossible for me to proceed unaided to take the numerous measurements that I had proposed to obtain, Doctor Deniker and Monsieur Goldstein kindly consented to join me, and it is thanks to their active cooperation that I have been able to assemble some documents that the Society has permitted me to communicate to you.

As we have been nearly the first persons to observe these savages, a few days after their arrival in Europe, I think that it will not be useless to add to our table of measures some descriptive details.

The Fuegians of the Jardin d'Acclimatation number 11, to wit there are 4 men, 4 women, and 3 young children. Two of the men appear to be 35 or 40 years old. The two others are unlikely to be older than 17 or 18. One of the women seems to be 35 or 40 years old, two others appear no older than 22 to 25, and the last one who is not a child happens to be a big, sturdy maiden of about 18 years. The oldest of the children is a small boy around 4 years old, and the youngest a little girl somewhat older than a year. Although she walks on her own, she still breast-feeds.

When we first came upon the savages, they were seated silently around a large campfire, their legs folded and backs somehow or other covered with a fox or guanaco skin, their unique outer garment, which will only conceal their chest whenever they hold it in front by hand.

With their teeth and hands, they were tearing to pieces bits of meat that they had hardly browned upon the embers.

The children, seated between the legs of their mothers, were chomping on some of the better morsels that the latter had given them. At other times one would observe a man (or sometimes a woman) slowly stand up, pulling the skin back across his chest, and make his way at a slow pace over to the fountain where he would then slurp up the water in the manner of animals. The mother of the youngest child, in the same way as the birds, gave the infant its drink mouth to mouth. She handled the child, moreover, with great gentleness, and at each instant where the small fox skin over her daughter's shoulders had slipped would reposition it, for the little wretches were not dressed any differently than their parents.

This sorrowful spectacle made us reflect on our Stone Age ancestors, whose appearance and kind of life must not have differed much from those of these poor savages.

When we approached them, they neither seemed to pay much attention to us nor stirred in any way. We tried to please them by offering them some bracelets and necklaces that we found necessary to have on hand. We seated ourselves near to them, in their manner (cross-legged), and we tried, by means of signs, to engage in conversation; but it was clear that, notwithstanding our gifts, we had not gained their confidence. It must be said that all of them had been vaccinated upon their arrival to the Jardin, and that they had sizable pustules on their arms which they had not yet been able to stop worrying about. From time to time one would hear them speak amongst themselves in a half-voice some unintelligible words.

Be that as it may, we were able to examine the color of their skin and hair, and ascertain certain qualities which did not necessitate the employment of any instrument.

The skin of the Fuegians was a reddish color, corresponding pretty near to Numbers 29 and 30 of the chromatic table published in the *Instructions*.

It was smooth, or nearly so, on the back and upon the shoulders and chest, save for an extremely fine fuzz which was not sensible to the touch and which one could only perceive by viewing it from a very oblique angle. On the legs and chiefly on the calves of the two oldest men, there were sufficiently long hairs, though thin and scattered. The chin and upper lip were not well trimmed, and only the oldest of the men, the one who we named *the captain*, had a real beard, although it was not very thick.

As for the two younger men, they had on their upper lip very fine soft hairs, adequately plentiful in number. The women possessed smooth, hairless armpits.

The savages' hair was a deep black color, straight, glossy and abundant, hanging down all around the head, reaching the eyebrows in front, which it in essence replaced, for the latter were hardly discernible: the hairs of the eyebrows were sparse and short, almost erect, and spread over only a part of the face; among the children, as well as with two of the men and the youngest woman, the face was nearly hidden by hair. The eyes of the Fuegians were very dark brown (Numbers 1 and 2 of the chromatic table), but of varying shape.

With most, the palpebral (eyelid) opening was quite elongated transversely and small in the vertical sense, but with one of the two adult males and above all with one of the females, as well as with the youngest child, the eye possessed a completely European shape. A most remarkable fact is that among the two oldest children, one of the young men, and one of the women the upper eyelid presents the characteristic fold of the Japanese eye. In fact, the aforementioned young man's palpebral slit displays enough of a pronounced obliquity to resemble that of the Mongolian race.

One female, if she had been suitably dressed and combed, could have been perfectly taken for a European, except for, of course, the color of her skin; nonetheless, I believe that one might easily find a type in Europe differing very little from her own among the least beautiful types (it is true) in certain countries of ours.

All our savages have, on the whole, a more or less large face, prominent cheekbones, and these qualities are so much the more pronounced from the height of the visage being considerably reduced by the lowered position of the hair. The superciliary protuberances and the glabella are very conspicuous, even in one of the women, the youngest.

The nose is somewhat depressed in height, large at its base, but substantially less flat than the negro race's: interestingly, one of the young men possesses a slightly bent nose like those of the Indians of North America.

Moreover, by the ensemble of their traits as well as by the shape of their skull, the Fuegians clearly appear at first glance to belong to an American race, although certain peculiarities cited earlier, and the sufficiently notable differences that these savages display amongst themselves, might be regarded as caused by some foreign influence.

I must add that all possessed small, quite confined ears. Their teeth are very beautiful and well-ordered, but extremely worn even among the young men, and one of these same, although hardly an adult, already has had all his wisdom teeth emerge.

I have not verified if their teeth are worn down to such a degree and so prematurely as those of the California Indian skulls belonging to the collection of Doctor de Cessac, at the Museum; nonetheless, what seems significant is that Doctor de Cessac attributes this wear to the presence of a fairly large quantity of sand in the mussels, which constitute the principal nourishment of the coastal Californians. Now, we know that the Fuegians also consume a great quantity of mussels and we have been able to observe that they eat them raw: they only for an instant place them upon the fire before breaking them open, and they do not take the trouble of cleaning them.

The height of the Fuegians is a little less than our own average; the totals will be given later. One of the women, the youngest, is nearly as tall as the tallest of the four men; the other women are short.

The two young men, named Henri and Pedro by the keepers, are well-built, of average stoutness. One of the two adults, who has been named Antonio, is thin; he possesses a wild appearance, and his skin is darker than that of his companions; he is even blackish.

He seems to be the warrior of the band. From time to time the keepers furnish him with a kind of large javelin which he throws skillfully into a sack filled with wood chips; he will then come over and settle in front of the fire for as long as until the keepers return to take back his weapon, because he does not like to bestir himself or be disturbed in the least. The other adult man appears to be more sociable. This is the one named *the captain*, although his authority is quite problematic.

He will not leave the fireside for long and will always seat himself close to the oldest female, who has by consequence been named *the captain's wife*, and also by the name of Piskouna. The captain possesses a quite placid, though somber, air. He appears truly attached to his wife, who he will hardly ever stay separate from; he will confer on her objects that he receives from visitors, and also shares his tobacco with her. He is, moreover, the only male that one could regard as married,

although three of the females have a child. To make a long story short regarding the captain, I must add that he is nearly one-armed, because one of his arms is atrophied, probably as a result of a shoulder dislocation suffered many years ago, from what I have been able to determine.

Like Antonio, he has spindly legs, and the gait of these two men is quite odd. They walk with an uncertain step, bending their legs a little and lifting their feet rather high, in the manner of a hunter who walks with precaution through the bushes. They land on and are supported by the outer edge of their feet, as is also the case with the women. The two young men, by contrast, possess a normal, if not fairly elegant, gait. All the men have a well-developed chest, most notable for its width as well as its being a little convex-shaped. They seemingly have an over-developed trunk relative to the lower limbs.

The youngest female, who we have named Lise, is not any smaller or less large in the shoulders than the men. Her very great fleshiness makes even more evident the bulge of her extremely developed deltoids, which are undoubtedly massive because of the necessity for the Fuegians, from what I can tell, to dive into the sea in order to procure mussels for themselves.

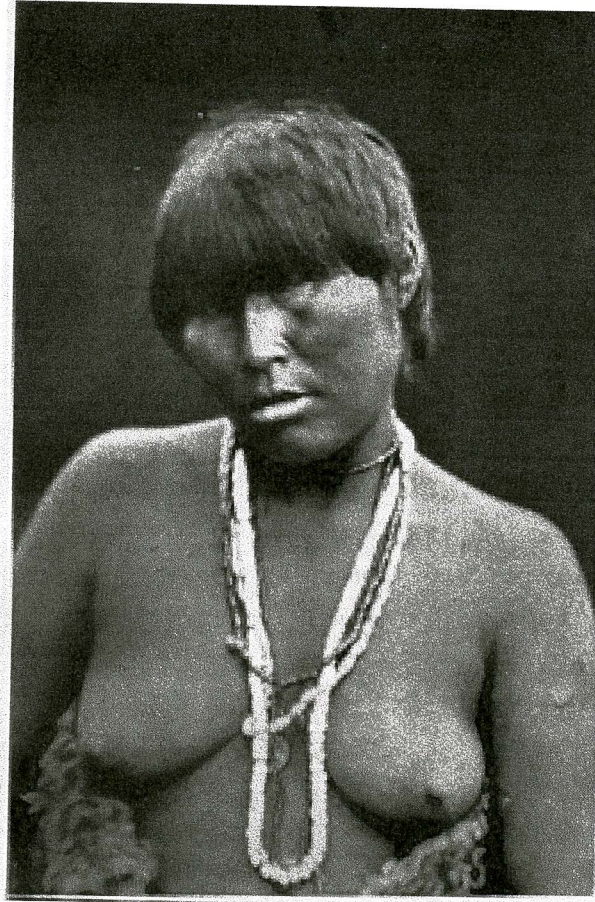
Because this maiden has never had any children, we were interested in and able to establish the size and shape of her breasts. They are quite voluminous and stand rather upright; they appear to belong to the variety named *pyriform*, though without exaggeration. The breasts of the other three females are more or less fading and drooping down, but they do not droop down any more than those of the women of our country who have nourished many infants. We have often observed them give breast in the European manner.

A little while ago I said that one of the men, Antonio, has blackish skin. It is the same with Piskouna, the wife of the captain, and these two individuals are likewise remarkable for the hairiness of their shoulders and calves. Piskouna also distinguishes herself from her companions by not being stout and by the more greatly reduced height of her visage.

The two other women are short and quite plump. One has received from the keepers the name of Catherine; she is the most beautiful with regard to the face. We have named the other *the little mother*, because she is the most diminutive.

It was this last female, *the little mother*, who was the first to become sociable with us and who showed herself to be the most intelligent of all the band in its dealings with us. She would thank us with a nod whenever we gave her some item: we easily taught her to say *merci*, and when we desired to proceed with the measurement of the head, to make drawings of the hands and feet, it was this woman who with good grace offered herself first; it is to her that we address ourselves then when we wish to obtain something from one or another of her companions.

As I have already mentioned, we presented ourselves at an unfavorable moment. All these unfortunate creatures were extremely dejected, suffering from their pustules and from congestion of the axillary glands. It was not easy to make them smile, and Antonio, the warrior, also clearly displayed to us one morning his ill humor by marching before us with animation, biting his guanaco skin and brandishing his bow. This same morning we were obliged to return to Paris without having secured any data, not that we had been intimidated by the semi-bellicose demonstrations of Antonio:



"LISE"

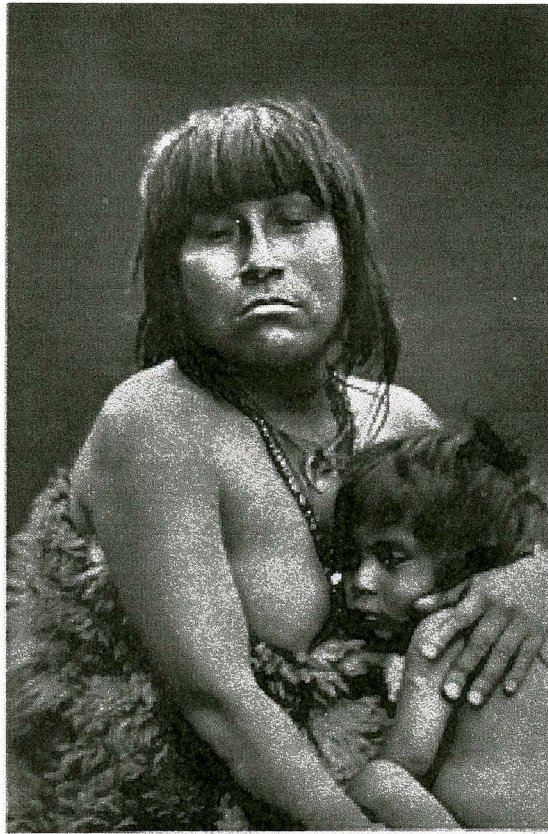
the poor man was not so terrible; but the small colony was sick, and it was necessary for us to wait two or three days for the Fuegians to recover.

Until then it was only with very great difficulty and patience that we had been able to take most imperfectly some measurements, but ever since the vaccinal pustules were on their way to healing, trust returned to our savages, and our relations with them began to become truly amicable. The little mother no longer needed to encourage her companions; the captain started to lose his shyness in his turn, and among the men he was the one who eventually lent himself most voluntarily to our observations.

We initially cut back on all the measurements that we have taken previously on others, because the poor Fuegians were so miserable during those first days that they were unable to stand upright or even lean against a wall for an instant without their legs melting under them and sweat forming on their brow. Once they found themselves sufficiently well, we were able to take on each person about fifty measurements, nearly all those that are recommended in the *Instructions* of the Anthropology Society. There was only one thing that we were unable to obtain: this was to examine and measure the genital organs. It turned out to not be possible for us to view any lower than the upper edge of the pubic region: our insistences on this subject were unavailing, and whenever we attempted to proceed by surprise to lower a savage's underwear, which by no means was the Fuegians' national dress, although they were so dressed here, each would quickly react by hand in order to stop us. However, they were not afraid that we would injure them, because they let us bring the points of a sliding compass very near to their eyes. Their preventing us from undressing them was therefore due to modesty (although they do not seem to have very much amongst themselves), unless it was from fear of disobeying the keepers who could well have succeeded in providing them, besides the underwear and the most indispensable notions of propriety, some lessons on decency and proper deportment.

I have not said anything yet about the intelligence of the Fuegians. The reason is that I do not believe it possible to say very much with certainty, and my observation of these savages has only served to render me most distrustful of psychological deductions formed out of parallel conditions. Nevertheless, if the question is only to give an account of the result of my impressions, I must say that the Fuegians of the Jardin d'Acclimatation look to me like beings brutalized by their miserable way of life, though they are quite pleasant and sociable in general. Furthermore, from my understanding of the intrinsic qualities of their race and the extrinsic conditions they must deal with, I believe the Fuegians to be sufficiently intelligent as well, if not for creating a civilization, at least intelligent enough so as to admit themselves into our civilization in an adequately large measure. Perhaps these people are not absolutely unconnected, besides, to those ancient American races which once attained a fairly high degree of civilization.

In order to seriously study our Fuegians from the psychological point of view, it would be necessary to sojourn with them for quite a long time, and regretfully my schedule does not permit me to do it. Maybe only the keepers can successfully place themselves in these necessary conditions for observing the savages at leisure and for learning how their contact and relations with Europeans influences their behavior now. As for me, I know enough to be very watchful for causes of error, which are so numerous and difficult to catch sight of when it's a matter of psychological observation.



"THE LITTLE MOTHER"
AND HER DAUGHTER

It is in this light that the modesty of the Fuegians seems to me most suspect; in fact, I believe their dread of appearing indecent, which one of the women manifested to us one day very clearly, is linked no less intimately to their fear of the keepers. Their laziness and apathy evidently have arisen from a lack of needs and to the forced idleness that has resulted from their new way of life. Fear and at least shyness seem to have an influence on all their acts, as much in their interactions amongst themselves as in their relations with us, and can we not understand, moreover, that a very intelligent man can appear to be considerably inferior to what he is in reality, even if he finds himself in surroundings little different from those in which he habitually lives?

It should be mentioned that the Fuegians of the Jardin d'Acclimatation happen to be extremely fond of gaudy adornments. The public generally only brings them such items, but I must say that useless objects which our savages don't consider of much utility have only provided so-so pleasure for them. Although they make their appearance in ribbons and bracelets, as I shall point out, they do not seem to attach any more importance to the ornamental gifts than the donators themselves; indeed, it has been my experience that the objects they have received with the most pleasure from me are useful objects in which they have comprehended their utility, such as knives, drinking glasses, etc. I have seen one of the women attempt to make a buttonhole on her guanaco skin with a knife. I showed the oldest how to avail herself of needle and thread, and immediately she began sewing, though making a knot after each stitch. Buttoned trousers and balls of string have been very well received, and one of the females made me understand that she no longer desired a bracelet, nor shiny trinkets, but instead wanted a basket and a drinking glass. Another one asked us for a comb. Moreover, they have not refused anything from us, laying aside in a corner of their hut or also at the foot of a tree those objects that they have determined are of little use, such as coins. I had the idea of presenting one of the women a doll that could lie on the floor in her hut: she turned her head away from me, but as I was insistent, with a slap and a scornful air she caused me to drop it. I noticed one day the youngest, Lise, to be very delighted. In passing before the crowd of visitors, she stopped herself in front of a beautifully dressed little girl and beheld her with visible pleasure, muttering some words between her teeth. After we had become quite familiar to the Fuegians, Catherine and the little mother made us understand that they had been astonished at seeing us possessing hair under our chins, and we could get them to laugh loudly by twisting our mustaches.

As they only blow their noses as a last resort, and most dirtily at that, doing so with their fingers or with a mussel shell, I showed them one day our way, which received their approval; but Catherine, all joking aside, only consented to putting her handkerchief back into her pocket.

They do not seem to have ever seen a mirror. I showed them one without their appearing startled at viewing their figure, which was undoubtedly unknown to them. But they were quite amazed and burst into laughter when I helped them see in the same mirror their figure, my own, and then that of their child.

I have remarked that the Fuegians appear sociable and pleasant, traits which they perhaps pursue under the circumstances. The fact is that they mutually yield to and perform diverse small services for one another, and do so with an air by no means constrained. If a woman is busy, another one will take care of her child; they jointly share their drinks, passing around their cups. The men, who have quickly learned to smoke, reciprocally lend each other their pipes and knives. The women never mistreat their children, even when they cry; in fact, when one of the children broke a glass that

we had given its mother, the latter, although very annoyed, contented herself with making a gesture of vexation.

This then is the undoubtedly quite incomplete information I have obtained on the deportment and behavior of our Fuegians. One might perhaps regard the smallest details that I have chosen to include as too insignificant, but it is difficult for me to indicate the most characteristic, having been obliged, as I have already noted, to satisfy myself with a very brief observation.

I have intentionally neglected to speak about the weapons and different articles of trade of the Fuegians, given that several members of the Anthropology Society can describe these objects with much more competence than I (see *Revue Scientifique*, October 8, 1881).

It only therefore remains for me to present the table of measurements of the different parts of the body, numbering around fifty, taken in conformity with the Instructions of the Anthropology Society. I shall only give here the averages and the reports of the height for each sex. But I have deposited in Doctor Broca's laboratory the complete table containing the individual amounts, which I shall be glad to acquaint anyone with who desires to take cognizance of such. Existing in this table are many drawings depicting the hands and feet. I made these drawings by tracing with a pencil the contour of the foot and hand which were pressed flat upon a sheet of paper, in pursuance of the method recommended by Doctor Topinard. Anyone may take from such drawings all the measurements that seem interesting to him. Two locks of hair have also been deposited in the laboratory by Monsieur Goldstein.

With respect to the hands and the feet, I shall limit myself to noting that with the captain the second toe was longer than the big toe, and that with Pedro a sizable gap exists between these two toes. Regarding the four hands that I have drawn, three show the third finger being longer than the index finger, and in the fourth case these two digits are even.

As for the three children, I chose to satisfy myself with taking their height and the circumference of the abdomen (at the level of the navel), being that these children appeared to me to present an abdomen much more protruding than that of our country's children.

Finally, I must alert you to the fact that all the following measurements represent projections, having been deduced from varying heights above the ground and from different reference points of the body.

Nearly all the averages have been taken on the four men as well as on the four women. I have denoted with a number between parentheses those averages which are based on less than four observations. In regard to certain measurement totals, one must keep in mind that two of the women are very plump, and that this plumpness exercises a large influence on the biiliac, maximum and bitrochanteric diameters, as it does also on the circumferences of the abdomen, thorax and leg. I have indicated in the fifth column of the table some proportions borrowed from material presented by Doctor Topinard in his course entitled: *Canon européen*.

Table of Measurements Carried Out on the Fuegians

(4 men and 4 women)

<i>DESIGNATIONS</i>	<i>MEN</i>		<i>WOMEN</i>	
	Averages. (in millimeters)	Percent of the Height.	Averages. (in millimeters)	Percent of the Height.
Height	1,612	**	1,516	**
Armspread	1,636	(3)	1,520	100.02
Height of the vertex above the ground, the subject being seated	829.2	51.4	789	(1) 52.3
<i><u>Head</u></i>				
Anterior-posterior maximum diameter	196.7	12.2	193.2	12.7
Transverse maximum diameter	157.2	9.7	155.0	10.2
Oblique auriculobregmatic diameter	137.2	8.5	136.5	9.0
From the vertex to the ear cavity	144.7	8.9	131.0	8.6
Total height of the head, from the vertex to the chin point	242.0	15.0	224.0	14.7 13
Frontal minimum diameter	103.2	6.4	102.0	6.7
Bizygomatic max. width . .	149.0	9.2	143.5	9.4
From the ophryon to the hairline	35.3	2.1	32.5	2.1
From the ophryon to the top of the nose	27.0	1.6	24.2	1.5
From the ophryon to the alveolar point	95.5	5.8	94.2	6.2
From the hairline to the chin point	183.5	11.3	171.0	11.2
Nose length	52.0	3.2	52.0	3.4
Nose, maximum width . . .	40.4	2.5	37.5	2.4
Ears, maximum length . . .	**	**	57.0	(2) 3.7
Ears, maximum width . . .	**	**	30.5	1.9
From the chin point to the top of the sternum	51.2	3.1	54.0	3.5

<i>DESIGNATIONS</i>	<i>MEN</i>		<i>WOMEN</i>	
	Averages. (in millimeters)	Percent of the Height.	Averages. (in millimeters)	Percent of the Height.
<i>Cephalic index</i>	79.97°	**	80.20°	**
<i>Nasal index</i>	77.6°	**	72.1°	**
<i>Facial angle from the superciliary point</i>	69°	**	65°	**
<i>Facial angle taken from the metopic point</i>	67°	**	65°	**
 <i><u>Trunk</u></i>				
From the top of the sternum to the upper edge of the pubis	527.5	32.7	516 (3)	34.1 33
From the top of the sternum to the nipple	129.5	8.0	**	**
From the top of the sternum to the navel	394.7	24.4	376.0	24.8
From the nipple to the navel	265.2	16.4	**	**
From the navel to the pubis	132.7	8.2	134.0 (3)	8.8
From the top of the sternum to the greater trochanter . . .	529.7	32.8	495.7	32.6
From the seventh cervical vertebra to the sacrum	585.0	36.2	539.2	35.5
From the top of the sternum to the iliac anterior-superior spine	442.7	27.4	418.0	27.5
Biacromial line	351.0	21.7	305.0	20.1
Bi humeral line	410.3 (3)	25.4	362.3 (3)	23.4 23
Biiliac line (crests)	299.2	18.5	349.3	22.5
Biiliac line (spines)	249.2	15.4	244.0 (3)	15.8

<i>DESIGNATIONS</i>	<i>MEN</i>		<i>WOMEN</i>	
	Averages. (in millimeters)	Percent of the Height.	Averages. (in millimeters)	Percent of the Height.
Bitrochanteric line	312.0	19.3	344.0 (3)	22.3
Chest width	292.0	18.1	289.7	19.1
Circumference of the thorax under the armpits	934.5	57.9	925.2	61.0
Waistline circumference . . .	873.5	54.2	958.0	63.1
 <i><u>Limbs</u></i>				
Upper limb, from the top of shoulder blade to the tip of the middle finger . . .	735.5	45.6	676.0	44.5
From the acromion to the epicondyle	297.2	18.4	265.5	17.5
From the epicondyle to the styloid process of the radius	255.7	15.8	225.5	14.8
Hand length (from the styloid process to the medius)	182.5	11.3	180.0	18.8 11.5
Lower limb (from the iliac spine to the ground)	876.0	54.3	820.5	54.1
From the iliac spine to the knee joint	461.0	28.5	432.0	28.4
Height of the ankle bone above the ground	62.2	3.8	51.2	3.3
Foot length	246.5	15.2	227.0	14.9 15
Height of the calf muscle (maximum projection) above the ground	312.0	19.0	256.0	17.0
Maximum circumference of the leg (taken upon the malleolus)	200.7	12.4	205.5	13.5

Pressure strength of two men (dynamometer) = 40 kilograms

<i>CHILDREN</i>	<i>The Oldest</i>	<i>The Youngest</i>
Height	916	762
Circumference (at nipple level)	602	475
Circumference (at navel level)	**	540

DISCUSSION

Doctor PAUL TOPINARD. You are modest, Doctor Manouvrier. Your observations are complete and conscientiously taken, and I just have a few impressions to add. I have only visited the Fuegians two times, while you have observed them four or five times. It is true, however, that my visits were not all that short, each lasting about three or four hours.

I am not qualified to speak of their language, as others have undertaken. Nonetheless, I have been struck by its simplicity, of its few syllables and above all by its intonation which is not guttural, but is rather buccal and like mucous. I do not know if their language can be considered monosyllabic given, for example, that their word for meat--*quieppa*--does not demonstrate such a categorization. I am also unaware if their words are connected with the American Indian languages, as some have asserted. But I must confess that, as a man of the world, I am unable to refrain from thinking that our early ancestors would have uttered their words in a similar manner, and that they were then probably employing a primitive language. I would be most appreciative if Monsieur Hovelacque, who I see is here today, could convey to me the real grounds for this vague impression of mine.

From the ethnographic point of view, I have much to say. I have seen their small open boat, made of overlaid strips of bark that are ring-bound; none of us would want to chance launching ourselves upon the Ocean in such a fragile skiff. I have also examined their bows which are as simply made as one can imagine, being composed of a plain piece of curved wood; their arrows are terminated by flint or a piece of obsidian, sharpened with retouches, exactly like arrows were made during the era of the reindeer in our country. Their vases and buckets are fashioned out of skin, which is what they use instead of pottery.

They have fabricated, or more correctly, one of the Fuegians made before our eyes similar arrowheads out of pieces of mirror or bottle glass. We would have preferred that flint had been used, but we did not have any on hand; in any event, Monsieur Geoffroy Saint-Hilaire, who has seen them work this material, assures us that the usual procedure is exactly the same, and that with either glass or flint, the result is identical. Here is how the Fuegian in question goes about this task:

Crouching low to the ground, he places the glass on the ground and strikes it sharply and repeatedly with a flat bladelike piece of iron that is fitted in a long handle made of wood, doing so in a way so as to obtain the longest fragments. This iron blade, as one might call it, appears to me to be part of a ring that has been straightened. Choosing then a suitably long fragment at his convenience, he places it in a piece of skin that rests in the palm of his hand, with the skin's edges being turned up towards him. Next, with a stick made of bone that is quite rounded at one end, he holds it with a firm grip in the right hand and begins to press hard against the skin's edges (right and left edge alternatively), the purpose being to remove splinters of glass by mere pressure or crushing. This work proves difficult at first when the edge of the glass still presents a flat surface, but becomes much easier as soon as some initial splinters have been detached. In the case of flint, it does not allow itself to be easily broken if what one attacks is a surface that has been exposed to air for a long time; it is, however, quite crushable as soon as a fresh and crumbly surface is obtained. A hard stone rests at the feet of the worker, upon which he will occasionally refile his stickbone's end, not to sharpen it, but to round it off. He only changes tools for making the lateral nock at the butt end of the

arrowhead, availing himself at this time of the first tool, the iron blade.

In short, this is the procedure that Doctor de Cessac saw being employed for some time by the Indians of California, apart from the following two particulars. The Californians will prop the flint or obsidian against a support (a large rock or stone slab), whereas the Fuegian of the Jardin d'Acclimatation holds it in his hand. The Californians supplement the pressure of the bone tool with a twisting motion, whereas the Fuegian contents himself with mere forceful pressure. It seems to me useful to add that the Fuegian *twice* was injured before our eyes by splinters of glass; but, this did not prevent him from continuing and devoting himself to the task with considerable earnestness and loving care. He was so pleased with the attention that we bestowed upon his work that starting from this moment the ice was broken between us and our new-made friends.

It is clear to me that the Fuegians, with the primitive tools and rudimentary forms of industry that they have shown us, still are at the level of the Paleolithic Age.

The remarks you made, Doctor Manouvrier, about their intellectual side permit me to be brief on this point. When the Fuegians first entered the Jardin d'Acclimatation, none of them possessed the notion of trade, let alone the value of silver. They threw away the copper coins that we gave them. We did, however, succeed in teaching one of them that given many coins with one of the pieces being white, with a lot of white pieces one can obtain a small boat, the pinnacle of their aspirations. I gave a franc to the Fuegian who had fashioned for me the arrowheads, and his facial expression indicated that he recognized that it was a different thing than the copper coins.

What most characterizes their psychology is the lack of curiosity and of wants. In their homeland they walk around naked, their leader assured me; in fact, it was on board the ship bringing them here that the crew ultimately succeeded in getting them to cover themselves with a guanaco skin (as do other inhabitants of Tierra del Fuego). They do not smoke; once again, it was while en route to France on the ship that they learned to smoke the pipe and cigarets. Their meals at home are often composed of seal meat, here of slabs of mutton which they fling down without precaution, not upon selected charcoals, but rather almost at hazard into the fire, removing them after hardly a minute covered with cinders (which thus become for them a natural seasoning). They savagely devour this meat, seizing it with their whole mouth while pulling on it with their hands. Here they also eat bread. Every day we serve them mussels, which they open by tossing them upon the cinders and leaving them there for some time; in their country this food comprises their habitual nourishment.

I said a minute ago that the Fuegians are not curious, the basis for this remark being that we could not succeed in interesting them in whatever it was. The men, however, became animated whenever they drew the bow, which they could do quite skillfully, and which we ourselves did without difficulty after two or three sessions. The women, on their part, only became aroused after we bestowed kind attentions upon them; from then on quite the same treatment was required just to keep them in check, as they very easily could overstep the mark. One evening the management of the Jardin escorted the entire group to the Circus. They understood very well the gestures of the clowns and laughed a lot; but the horses frightened them, which so much the more deserves being noted, as, on the other side of the Strait of Magellan, the Patagonians are inseparable from their horses. They kept from this evening out one common remembrance, as one moment, while

conversing with them at the edge of the fire, I was astonished to suddenly see their physiognomies become illuminated and their heads all turned in the same direction; the cause of this was the passing by of the carriage that had taken them to the Circus.

One thing struck me: their disinclination to dress and dislike for gaudy objects. They took with indifference the playthings and ribbons that we gave to them, and it was mainly upon the insistence of the Jardin's employees that the women happened to end up wearing necklaces. The latter were flattered when we occupied ourselves with them, and above all when the men were absent elicited our attentions, acting in the manner of coquettes. One of the darlings, however, having lost her celluloid bracelet in the grass, I soothed by lifting her up in the air; she settled down and resumed her way without being upset. The love of dressing oneself up prettily, which we naturally take for granted as comprising an important aspect of feminine coquettishness, is therefore lacking among these savages, contrary to what some travellers to Tierra del Fuego have asserted.

I came away, in short, from my first day spent with the Fuegians with a very bad impression. It was the ultimate image of brutishness and indolence. I clearly recall seeing one become agitated upon my carefully scrutinizing him, without speaking, while taking notes. The conclusion I reached after this first day conformed to that of Darwin, who encountered his six naked Fuegians near Wollaston Island. But, I experienced a change of attitude during my second visit. I played with them and they appeared to me under a somewhat different light, that is to say, as unhappy timid people, offended at being so exposed to public ridicule; yet I found them pleasant, cheerful and manifesting the signs of all sorts of aptitudes and sentiments that we have not ascribed to them and are unfamiliar with.

From the standpoint of their physical appearance, after the precise individual observations you made of them, Doctor Manouvrier, I shall only offer some synthetic impressions. These Fuegians are not homogeneous by type. The men present very notable differences; on the contrary, the women are quite similar to each other, which merits being taken into consideration, if one recalls the opinion that holds that the women retain to a greater extent the primordial type that has contributed for the most part to the formation of the race under observation.

On the whole they display, though in diverse degrees, a great many attributes of the yellow race. Their hair is straight, stiff, and black. Their skin color is yellow-brown or a yellowish red chocolate, a shade which, by the way, is perhaps the second most widespread on the surface of the globe, after the shade and tint of the Europeans in general. Their height is short, their head large and tall. The face is diamond-shaped (Monsieur Prichard and Doctor Pruner-Bey have described it as Mongoloid), that is to say, pyramidal from its top and triangular from its base, which is essentially owed to its projection, spacing, and I must also add to its massive cheekbones. Generally, though, the face is flat, especially in the nasal and interorbital area. The nose, on many of the females, is at its base narrow and eminent (though flattened), while being wide and flat at its root. In two of the Fuegians this root, which resembles in an extraordinary way that of the Eskimos, presents on top of the face's median line a slight upswelling formed by the appropriate bones. The eye opening varies; with the most typical it is small, oblique, pinched at the outside, and rounded on the inside. The facial hair differs somewhat among the men, but in general it brings to mind the sparse and rigid hairs of the Chinese and Japanese.

In short, the most general type that can be deciphered from this small group of savages is essentially Eskimo, which is only to say that the Fuegians display all the Eskimos' qualities--dolichocephalism, for example. But, one encounters here a number of variants: some of the Fuegians, for instance, share a distant resemblance with certain Amerindians, which is hardly astonishing given that, judging by the admirable album that the Society possesses on the Indians of North America, many of the Redskins call to mind the Eskimo type. The Head of the Archives Division at the Ministry of Foreign Affairs, Monsieur Girard de Rialle, who was with me on my second visit, is of the opinion that some of them resemble the Quechuas of Peru, which again is a rational belief, because the photographs of the Quechuas are themselves often imagined to be those of the Redskins of the North, and it is for the same reason that these Amerindians are made out to be Eskimos explains why the Quechuas have been also. Moreover, I totally share the impression of Monsieur de Rialle. Additionally, some of the Fuegians vaguely remind me of certain pictures of the Botocudos that the Society possesses. All these resemblances are entirely in order. For "race" is a conception of our mind; it is characterized by a type that we reconstitute by thought and which we regard as being perpetuated across the numerous mixtures that the affected individuals have undergone. The traits that a series of individuals present are never those uniquely of the type which have contributed the most to its formation. Instead, these displayed traits are both a superimposition and a mixture in diverse proportions, in accordance with the individuals of different types who have converged in this formation. Here then is why in the same tribe one individual reminds you of the Eskimo, another the Redskin, a third the Botocudo, a fourth the Patagonian, etc.

To sum up, the principal type that one meets with among these Fuegians, particularly among the women, is highly Mongolic or of the yellow race. Further, this type has diffused itself throughout the two Americas, which also merit being classified as Mongoloid. Although it is ugly and gross, this type is not as inferior as those representative of the Bushmen, Tasmanians or western Australian aborigines.

From the physiological point of view, these Fuegians, in spite of their apparent brutishness and the lack of interest that they display in what is happening around them, as well as their indifference to the slightest comfort, conceal aptitudes and sentiments that are susceptible of being developed perhaps more rapidly than one might deem possible. Permit me then to confer on them the name *race* under the reservations that I have previously cited. This is a race which intellectually has not evolved--in fact, has maybe retrograded--and which only exists in the state of inferiority that we have determined by the dearth of circumstances to which it has been exposed. No doubt driven back by conquerors into a desolate extremity of the world, alone by itself in this region, without neighbors, and consequently without rivals and competition, it lacked excitants which are so necessary for men to rise in intelligence and in civilization and to attain succeeding stages of progress.

One last word. The physical aspect of the Fuegians, which I was only aware of from the veritable caricature of them that some had published, confirms the following theory that I originally set forth in the first edition of my *Anthropologie*--a theory based on a series of skulls of the Patagonian horsemen belonging to the Tehuelche tribe that Monsieur Moreno of Buenos Aires had given to our museum.

In the distant past, I believe the two Americas were inhabited by an Eskimoid race, similar to

the present-day Eskimos. A brachycephalic race very likely from Asia arrived later. Now constituting the predominate American race, this second influx distributed itself throughout the Americas, crossbreeding with the original inhabitants at certain locations and exterminating them at others, while driving back more or less intact one part of the Eskimoid peoples to the Far North and the other part to the extreme South. One of these remnants is the Eskimo race that we behold in Greenland, the other this more or less altered Eskimo element that we find among certain Tehuelches and in the Fuegians of the Jardin d'Acclimatation. This, then, is what I have called the duality of the American races.

From the time after these two races fixated themselves geographically, though, the question of understanding the racial composition of the Amerindians becomes complicated. Monsieur Moreno's photographs display to us an ancient Neanderthaloid type, quite widespread in the territory where it has been studied and where it has clearly failed to lose its existence. The skulls of the Botocudos as well as those of the coastal California Indians reveal to us a particular type that is more recent, nice-looking, and dolichocephalic. Moreover, in North America it is necessary to grant recognition to yet another type, one possessing a prominent nose (totally European in appearance), most different from the surrounding Asiatic type that is especially abundant in Central America. It is therefore not a question of two races, but of four or five American races, which compels me to believe that America, as well as Europe and Asia, has experienced its revolutions of races and mixtures of all sorts of peoples dating back to the remotest times.

I shall now circulate, messieurs, the photographs of the Fuegians which I owe to the obligingness of Monsieur Geoffroy Saint-Hilaire. You'll see that two of these pictures, concerning the female that we have named Lise and the one that we have labelled the captain's wife, convey the Eskimo type preference upon which my attention has been attracted and which I have described.

Monsieur GABRIEL DE MORTILLET. I have to say that the Fuegians possess a very easy-going and mild disposition. I was a witness, in fact, to the following scene: one of the spectators had given a piece of sugar to an infant. The child, not understanding the use of the gift that had been presented to him, flung it away. One of the women picked it up and began to eat it. Seeing this, the infant became quite upset, took some stones and threw them at the woman, striking her. I was surprised to observe the latter allow this to happen without displaying any resistance or anger.

Monsieur PAUL NICOLE. It seems to me that the Fuegians examined here in Paris must differ from when they are amongst themselves back in Tierra del Fuego. As a matter of fact, messieurs, you all know that they have been forcibly carried away from their homeland by an individual who wanted to exhibit them in Europe. They did not come directly to Paris, but instead passed a month in Europe before reaching Paris.

Now, a long time was not necessary in order to alter the psychology of the Zulus who made their tour of Europe over a two-year span. They became adept at undertaking all sorts of trips to which in Africa they had never been exposed. It was as savages that they first beheld the foot of our continent; when they left it, they were crafty and adroit.

Monsieur ABEL HOVELACQUE. One should not in any way compare the Fuegians with

the Kaffirs, who form, among the Negroes, a very elevated population. You need to realize, Monsieur Nicole, that I have studied the Fuegians not only here, but in their homeland. What we have seen in the zoological Jardin vouches for the complete veracity of the explorers who have observed the Fuegians in their rightful terrain, and in my opinion their descriptions have been faultless. The perfectibility of the Fuegians appears to be arrested, but this is nothing extraordinary; one can point out a number of such individuals belonging to inferior races who, after having received a European education, have returned to their wilderness homeland with joy. This has been particularly so in the case of a native of Brazil, who earned his doctor of medicine diploma. I could cite a number of other similar examples.

As for the language of the Fuegians, undoubtedly very little is understood about it, but one can only suppose it to be monosyllabic. All the world's idioms at one point or another have unquestionably entered into the period of monosyllabism, but quite developed races (such as the Chinese, Siamese, Annamese, etc.) have themselves been only able to fix their language to this period, doing so by resorting to expedients and ingenious methods. Peoples occupying the highest human echelon, though, have all advanced their language from monosyllabism to polysyllabism.

Doctor JOSEPH DENIKER. I have not till now spoken about the exact provenance of the Fuegians. Their guide assured me one day that they came from Horn Island, while on another occasion he told me that they were taken from Hermite Island.

If this latter origin is correct, our Fuegians ought to belong to the same tribes as those described by Fitzroy and Darwin, that is, tribes inhabiting Pouson Bay and the length of the Beagle Channel, a distance of nearly 200 kilometers northwards of Hermite Island; nearer yet, along the length of the strait of Goerri Road, Darwin saw Fuegians resembling the former.

With respect to the geographical distribution of the Fuegians, I shall note that the eastern part of the large island of the archipelago of Tierra del Fuego (Tierra del Fuego Island, properly so-called), is occupied by the *Yahgans* who, according to Fitzroy, Darwin and Giglioli, by their tall height (1.8 m), their way of life (they are not seafarers), and by other qualities, clearly distinguish themselves from the Fuegians and more closely approximate the Patagonians.

So therefore, the Fuegians are backed into the western and southern part of the archipelago of Tierra del Fuego. Their northern limit is the Strait of Magellan; however, one can sometimes note their presence beyond this strait, notably at Port Famine and in the Chonos archipelago.

As for perfectibility, I must point out that in 1833 Fitzroy transported four young adult Fuegians (natives of the part west of Navarino Island) to England. This project was said to have been very successful. During a sojourn of three to four years in England, the Fuegians acquired English passably well and civilized manners; they became smartly dressed, stylish, and most proper. Never in their relations with other persons did they denote a savage nature.

In speaking of perfectibility, I have in mind the individual's capacity for improvement. Monsieur Hovelacque, you would probably be curious to know what became of Fitzroy's Fuegian students the day they returned to their home. I am able to inform you that this situation occurred and was tracked. Three of these four Fuegians were repatriated; but, shortly after they landed, their

compatriots stole everything they had brought back with them. Dispossessed therefore of whatever instruments and tools that they had brought, these unfortunate creatures found it necessary to lead the same manner of life as all the other inhabitants of these desolate islands. Consequently, some time later, when Fitzroy visited for the second time the place where the young Fuegians had disembarked, he recognized one of them who was carrying on the way of life of a savage; but the latter had not forgotten his English and told Fitzroy that he was very content with his existence. This is not surprising, because attachment to one's native country--patriotism, if you will--is highly developed among the Fuegians. These then are the facts. What do I make of them? They only prove that it is perhaps asking a little too much for a savage who has passed some years in the midst of civilized people to become an apostle of civilization without his having in hand the advanced tools of this civilization and without his enjoying continued relations with the civilized world, especially if he lives in an area where the battle with nature's elements is extremely hard. I believe that many Europeans would become savages under these conditions as well.

Doctor PAUL TOPINARD. It pleased me greatly, Monsieur Hovelacque, seeing you motivated to provide us with your interpretations; it is what I desired. I do not have any intention to enter upon the terrain of linguistics; regarding that of the physical and physiological qualities, that is another matter. Now, I have heard you claim on a previous occasion that, by the nature of their physique, the Fuegians are an inferior people. Upon what do you base this contention? The Fuegians possess a large head, and consequently a large brain in proportion to their body. I do not see that it is necessary to look any further than this, unless one ceases considering the brain as the supreme criterion for determining superiority and inferiority. You have spoken, Monsieur Hovelacque, of the Fuegians' bodily proportions; but precisely, by what is best known in this regard, these proportions are more indicative of superiority than those belonging to the white races. As we know, Negroes possess the longest upper limbs and hence come nearer than other races to resembling the apes; European races, by contrast, possess shorter limbs and therefore are further removed from these same apes. Well now, it turns out that the Fuegians possess even shorter upper limbs than do Europeans! You then indicated to us today that you are convinced that any Fuegians that have been educated and elevated by us, as was done with some Australian aborigines, will on the first occasion, as did the latter, jettison their habits and run off into the woods. You are convinced, granted, but I do not believe such will happen; I won't believe it as long as observation has not imparted knowledge to that effect on me. This is a supposition on your part, an act of sentiment, an *a priori*.

With respect to the question of the origin of these Fuegians, here is the information that I possess. They inhabit a bay named *Saint Martin's Cove*, in the southern part of Tierra del Fuego. They were hungry and came on board; one was sick and required care. They became accustomed to ship life, and during this time we obtained the authorization from I do not know which authority to take them away to Europe (for they were neither able to form a contract nor were capable of understanding what we desired of them).

This bay of Saint Martin should be registered in any formal observation of these Fuegians, because certain areas of Tierra del Fuego are occupied by Fuegians who are not as authentic as ones living in other parts of this territory. For example, those living in the North possess affinities with the Patagonians who inhabit the other side of the strait. Thus it is that the Fuegian who we have named Lise is tall (whereas the others are short), a quality which most certainly springs from an

earlier crossbreeding with these Patagonians.

As I have done with Monsieur Hovelacque, I want to respond to your point, Monsieur Nicole, and say that the Zulus do not have any affinities with the Fuegians with which we have occupied ourselves. The Zulus are relatively superior Negroes who, in past times, succeeded in conquering most of southern Africa and imposed their language on the inferior Negro tribes. Professor de Quatretages himself asserts that the Zulus are the result of a hybridization of the Arab with the Bushman.

From what I am able to judge of their intelligence, the Fuegians are inferiors due to their absolutely negative civilization, but not from their physical type, which is that of the yellow races. They are a vanquished people who have been driven back into an inhospitable land and are living far from any competition and stimulants to progress. Change their milieu, acquaint them with present-day advances, and they might be able to metamorphose themselves. Their brain allows it.

Monsieur GIGNOUX. When I observed the Fuegians, I happened to encounter a member of the Society of Ethnology who had with him a vocabulary of the Fuegian language, prepared by Admiral Ross.

He exerted himself to understand the Fuegians with the aid of this vocabulary, but was unable to succeed in his endeavor.

One might object, certainly, that Admiral Ross, in transcribing the Fuegian words into Latin characters, gave to these letters the value that they possess in English. I must say, however, that the ethnologist who I saw at the Jardin d'Acclimatation speaks English perfectly and could adjust to and handle this difficulty.

To conclude, it seems to me that the Fuegian language has undergone a rapid evolution, being that it has already changed since the voyage of Admiral Ross.

Monsieur ABEL HOVELACQUE. It does not surprise me, Monsieur Gignoux, that a person studying a vocabulary where the accent and certain pronunciations of sounds can only be transcribed approximately is unable to understand it.

As for the rapid evolution of the words in the Fuegian dictionary, this is neither an improbable nor isolated event.

Regarding what constitutes a language, it is not so much its vocabulary as its morphology.

Doctor ARTHUR BORDIER. What makes for the superiority or the inferiority of a people is not the greater or lesser length of the humerus, but rather the state of their intellectual faculties. What particularly characterizes the inferior peoples is the absence of the sense of curiosity.

The Nubians and Zulus possess this sense. They are curious as infants, like intelligent children are. The Fuegians, on the other hand, while away their time with indifference in the midst of our civilization. You have observed them attentively, Doctor Topinard, but I am certain that they

have not observed you! Although our world is so new to them, they do not seem impressed, surprised, nor interested in anything that passes before their eyes. In short, curiosity is the *sine qua non* condition of all progress.

Doctor PAUL TOPINARD. I do not hold true any more than you, Doctor Bordier, that there are races that are superior or inferior in an absolute manner. Nevertheless, we completely understand ourselves when we avail ourselves with these expressions. They are employed from two points of view.

Incontestably, there are races more intelligent and more civilized than others; these we call superior. By contrast, there are races, located at the other end of the scale, who are inferior. Among races, if one draws a parallel between any two, there will always be one which will be inferior in relation to the other.

From the physical point of view, one can observe the same gradation. The lowest races are those whose ensemble of important physical qualities--brain size, body proportions, prognathism, facial angle, inclination of the ear cavity--most closely resembles those of animals, in particular apes. The highest races, by contrast, are those whose physical qualities are the furthest removed from what one finds in the apes. It is for this reason why the European races are, with good cause, considered superior in comparison to the Negro races, and to a lesser degree with respect to the yellow races.

It is truly difficult, after all that has been said, to determine to which race the Fuegians belong, and it seems to me that there is a much simpler explanation to their origin than those that have been invoked. In the small number of individuals submitted for our examination, I mentioned earlier that I found qualities typical of Eskimos, Botocudos, Redskins, etc. This shows that the Fuegians are not at all a homogeneous race, but rather one formed by intermixtures of extremely diverse individuals emanating from more or less distant regions. After a close examination of the Fuegians themselves and of the photographs that I have taken of them, I do not at all find anything in their appearance that permits one to categorize them as a physically inferior race. But for the color of their skin, most of them, if they dressed as Europeans, would be able to circulate in the streets without attracting the least attention. It is only from the intellectual point of view that their inferiority is evident. It is extremely difficult to clearly provide a judgment with such an insufficient number of elements available for investigation, but I do not believe in standing aside from the truth, and must say that these Fuegians do not at all belong to inferior races, and that the observed intellectual inferiority of the Fuegians arises from their miserable conditions of existence. Given a setting where savages deprived as them of all resources live, Europeans themselves would certainly reach in a few generations an analogous state to that in which the individuals under discussion find themselves.

Doctor GUSTAVE LE BON. I can by no means partake in the theory that you have espoused, Doctor Bordier, that the superiority of a race is revealed by the development of the sentiment of curiosity, and I do not know upon what psychological facts you can base an assertion so contrary to what the observation of each day teaches us. Far from being unique to superior races, the sentiment of curiosity is mainly to be observed, on the contrary, among creatures who are most inferior. After all, what is more curious than a very young cat or juvenile monkey, let alone an

infant? Anything will arouse their curiosity! It is also true that anything will distract them, and in this incapability to concentrate their attention for a long time upon a single matter, you will find, Doctor Bordier, a sign of inferiority considerably more real than the absence of the sentiment of curiosity by which you have set your thermometer. It is impossible to find in a single quality the means to differentiate races. However, if I had to embrace in one formula those qualities which enable one to establish the hierarchical differentiation of races, I would say, just as I have done in my earlier work, that what constitutes above all the superiority of individuals and races is the greater or lesser degree of their aptitude to associate ideas and to perceive the various analogies and differences among such ideas. An inferior intellect like that of the Eskimo can associate only two ideas at a time and is only able to recognize their most apparent analogies. Because ice has a resemblance to glass, he concludes that glass will melt in the mouth. At the other end of the scale will be found the savant, capable of associating a great number of ideas and comprehending under their apparent analogies their real differences. He sees why the whale is like the horse and why it differs from fish, how the skull is of a similar nature to a vertebra, etc. I shall not persist any more with this point, which requires a great deal of development. Nonetheless, for those interested, I have presented this matter at length in the first volume of my work, *L'Homme et les Sociétés, leur Origines et leur Histoire*.

Monsieur ABEL HOVELACQUE. It troubles me that some of our Society's members cannot understand in the same manner the terms *inferior races* and *superior races*. Is it not clear and evident that from the anatomical point of view we must give the name *inferior races* to those who by the aggregate of their physical characteristics come closest to the great apes? Regarding the mental order, there is no need to consider but one faculty, that of curiosity and the degree to which it is possessed. If it were necessary to be content with a single psychological trait, I would say that what most distinguishes the superior races is their slight propensity to credulity. But here again this characteristic is produced by a combination of actualities. **Lastly, messieurs, we can clearly observe that the inferior races, as determined from the anatomical point of view, are those who likewise are the least advanced from the point of view of intelligence.**

Clearly, the ultimate irony of this memorable meeting was that it set in motion a chain of events which led the two speakers who had teamed up so successfully in presenting valuable data on the Fuegians—Le Bon and Manouvrier—to permanently sever all relations with each other just three months later! But, that's another story and another pile of Anthropology Society papers for me to go through.

Wishing you, as ever, sound health and good cheer, I remain,

Your friend,
Robert

REMINISCENCES OF A FREQUENTER
TO THE
1878 MEETINGS
OF THE
ANTHROPOLOGY SOCIETY OF PARIS

Featuring:

*Classic papers delivered by Doctor Jacques Bertillon, Sr.,
Doctor Gustave Le Bon, Charles de Ujfalvy, Professor Paolo Mantegazza,
Dimitri Anoutchine, and Doctor Arthur Bordier*

Robert K. Stevenson: Translator, Editor & Reminiscencer



CHINESE TYPES

86, rue de Courcelles
Paris, France

July 3, 1929

My dear friend,

I cannot begin to express how much I appreciated your sending me the study by Rabourdin as well as your many remembrances and insightful comments about Professor Dally's lecture before the Society. I wholeheartedly agree with you that Dally was way ahead of his time in deciphering the worst effects of urbanization—certainly, today's typical Parisian is a major downgrade from his predecessor of 50 years ago—and must say that not only does urbanization lead to human degeneracy, but even worse, in my estimation, it invariably produces a depersonalized society.

You asked me if I still possessed any papers dating earlier than 1881. In fact, I do (for I have always been a saver). Two years before we met I was already frequenting with regularity the Anthropology Society's afternoon meetings. The enclosed batch, which I believe you will enjoy, dates from this period—1878.

The March 7th meeting was one I well recall. Following an interesting presentation by old Doctor Bertillon and cohorts, Le Bon gave a talk about the unequal shape of the skull's corresponding regions. His findings solved a long-held personal mystery for me. You see, my right parietal contains a bump that is not present on my left parietal. Throughout my youth this had worried me, particularly whenever I would have a headache, for I irrationally imagined that

the bump might be a tumor and the cause of the headache. Le Bon's presentation dispelled my fears, as such bumps on the skull are the norm. Indeed, one thing anthropology has taught me over the years is that abnormalcy is normal.

“On the Examination of a Negro from the Point of View of the Nature of the Hair”

by Doctor Jacques Bertillon, Sr.

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 7, 1878

Messieurs, you have directed a commission composed of Doctor Bordier, Doctor Topinard and myself to examine the hair of a male Negro who currently is a patient at the Hôpital de la Charité. This Negro's hair, as you recall, had earlier been studied by Doctor Topinard.

You well know, messieurs, the importance that many of us have always attributed to the nature of the hair and its manner of embedment in order to make a distinction between the different races of mankind. Of the famous naturalists, Bory de Saint-Vincent, and later on Huxley, Haeckel and several others have even, just based upon this sole characteristic, founded a classification of the human races.

We are accustomed to distinguishing among Negroes possessing woolly hair two modes of embedment of the hair; in the first case the hairs are uniformly and regularly distributed over the surface of the skull, whereas in the second the hair emerges from the scalp in isolated tufts that are surrounded by smooth spaces, a bizarre configuration that some have likened to the arrangement of a brush's bristles. This odd-looking mode of embedment of the hair is the one that has been ascribed to the Hottentots.

Can it be that this latter mode of embedment portrayed by travellers to Africa, in fact, does not exist? Is it possible that the travellers have been duped by an illusion resulting from a much too superficial examination? These are the questions that instigated our examination of the Negro initially studied by Doctor Topinard.

At first sight, it seemed perfectly evident that the Negro's scalp was embedded by disjoined tufts of hair. It was not only on the head that we observed this as well. In any event, here the hair is so abundant and padded that the *peppercorn* configuration does not present upon the head the same illusion as it does in other places where the hairs are more sparse. It is on the nape of the neck, the cheeks, the stomach and groin area, and above all on the chest that the hairs look like tufts separated one from the other by about 5 to 10 millimeters, depending on the region. This appearance is so obvious that, in the absence of Doctor Topinard, our initial impression was that the hair of this Negro manifested the same mode of embedment that has been attributed to the Hottentots, and which I described earlier.

However, our learned colleague has cautioned us that this is but an illusion, that this misleading appearance results from the inextricable tangle of hairs of this Negro, who is completely ignorant of our practices of cleanliness. We therefore tried to disentangle these small tufts of hairs with the aid of a stylet; but this attempt was not demonstrative.

One other experiment, much more decisive, was performed on the nape of the neck of this Negro. The peppercorn configuration of the hair here is quite apparent. We shaved one part of these hairs, and left the others in their original condition. The contrast was very striking; we saw, in the shaved area, the roots of the hair laid out most regularly in horizontal rows spaced about 1 or 2 millimeters apart from one another, and it was clearly evident that the brush bristle configuration that we thought we had observed before employing the razor was a mere illusion.

We have repeated this experiment on the Negro's groin area, and observed exactly the same thing.

It is therefore possible that the arrangement of the hair in isolated tufts that people ascribe to the Hottentots is but the result of an analogous error. A good comb out probably would do justice to the Hottentot's appearance.

The Negro singled out by Doctor Topinard is not, however, a Hottentot. He was born in Barra in Brazil; hence, it is difficult to state precisely his origin. According to Doctor Topinard, though, he is probably of Kaffir extraction.

We examined the Negro from top to bottom. The only peculiarity that we found worthy of interest was a certain discoloration of the skin at the level where the testicles of this individual rest against the inner face of his thigh. On a white person this place is often darker than neighboring areas; with this Negro, it is the contrary. The scrotum itself is, moreover, a rich black color.

I then proceeded to see if this lightening up of the black color occurred at other depressions of the Negro's skin. However, I found exactly the opposite.

DISCUSSION

Doctor PAUL TOPINARD. In a previous meeting I named Monsieur Macklucko-Macay and Monsieur Meyer as having spoken out against the assertion that the hair of the Papuans of New Guinea is embedded as tufts that are separated by smooth, hairless intervals. I shall add that Doctor Comrie and Monsieur Alberti, who after having focused their attention upon this very matter during their recent travels in Papua, are of the same opinion. Monsieur Moseley can be cited next, although his observations deal with the natives of the Admiralty Islands, which border New Guinea. After having verified that their body is covered with frizzy, black hairs that appear to grow in isolated tufts, he wrote the following: "This appearance is probably due to the fact that the hairs, although distributed uniformly in terms of their roots, combine together through their shafts to form curls; it goes without saying that concentrations of hairy follicles manifest themselves at certain points, which give rise to scattered tufts, a peculiarity that from the very beginning we supposed existed on the scalp of the Papuans."

As far as the Bushmen and Hottentots are concerned, I can also relate some testimonials. For starters, Cuvier, such a good observer, does not mention finding hairless intervals on the head of the female Bushman that he studied. Jeffries Weyman, a most distinguished American anatomist, did not say a word about such hairless intervals with respect to the young Hottentot of whom he produced a

description. Flower and Murrie are absolutely affirmative on this matter in their work pertaining to the dissection of a female Bushman in 1867. "A careful examination of the scalp," they wrote, "permitted us to assure ourselves that the hair did not grow out in separate spots surrounded by smooth spaces, as some have maintained, for we found the hair roots to be uniformly disseminated." Lastly, today even, with Doctor Hamy, we have examined at the Museum a Hottentot child of about eight years of age who is preserved in alcohol: his short, frizzy hair was embedded in a regular manner across the entire surface of the scalp without allowing for intervals. As for the Negro at the Hôpital de la Charité, just as Doctor Bertillon has noted, we shaved the subject's hair in two places: the lower abdomen and nape of the neck, after having first of all clearly determined that the hair expresses to the highest degree at these points the characteristic tufts, apparently isolated, as Barrow has described. The exact points where the hairs were embedded thus became visible, in the form of small, dark dots or short projections. Well, messieurs, these points were equally spaced from 1 to 2 millimeters apart in parallel lines which now and then converged; and, these points more or less drew nearer to one another depending on the hairiness of the region. Each tuft was therefore only the fortuitous result of a coming together of the spiral turns of several neighboring hairs.

Accordingly, I must conclude, like I did last meeting, that the aspect of tufts really exists, but that with the Negro we studied it is not the result of an embedment of hairs in isolated bunches. Consequently, one is not able to emphasize this quality in order to divide the *Eulotrich* Negroes into two groups, the *Lophocomi* and the *Eriocomi*, as Professor Haeckel has done.

For my own part, I believe that uncombed fleecy hair always masses itself together into small balls, varying in size from the peppercorn to the pea (Livingstone's comparison), in twisted locks or cords, depending on the hair's length. But, the peppercorn appearance, the so-called bristles of a brush aspect, occurs more readily in proportion as the hair is the following: less abundant on the surface of the head or body, naturally or artificially shorter, and less combed.

Doctor ARTHUR BORDIER. As Doctor Bertillon has pointed out, upon first viewing the subject, it appeared that the Negro's hair was embedded in the manner of peppercorns, but a second examination revealed to us that his individual hairs were aligned in parallel lines. Therefore, with this man, there is no possible doubt. One can also observe poodles who possess hair that has a peppercorn arrangement; but if one pays more attention to the dog's hair by looking at it closely, one will notice that each hair is embedded in the same way as is the case with the Negro.

However, it must not be inferred that there is no human race that presents the hair's embedment in islets. Research has been conducted on the Mincopies of the Andamans. As they shave themselves, it is possible to see how their grows. And, it has been ascertained that the hair of the Mincopies grows in distinct islets like the bristles of a brush; consequently, this examination has provided a different result.

Many reliable observers have noted in India this disposition of the hair among certain short, dark tribes. This may also originate from a parasitic malady.

“On the Inequality of the Corresponding Regions of the Skull”

by **Doctor Gustave Le Bon**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 7, 1878

During my studies that I have pursued for a long time concerning the variations of the brain's size and shape that one observes among individuals belonging to the same race--studies whose findings I intend to soon entertain the Society with--I have had occasion to investigate whether the different parts of the cerebral hemispheres on the right side and on the left side habitually possess the same size.

Not being able to easily obtain a determination of the weight of the brain and its associated parts, I was obliged to effectuate my research upon the skull itself. My measurements have been taken on nearly 300 skulls belonging to different series in the collection of the Museum of Anthropology, which were graciously placed at my disposal by Doctor Broca.

For a long time anatomists have wondered whether the two cerebral hemispheres are quite alike. The most widely held opinion has been that of Bichat, who considered that a lack of symmetry of these organs must be accompanied by a lack of sound judgment. The autopsy of this famous anatomist, whose own skull proved to be most irregular, demonstrates how little this opinion is well-founded.

With man, the majority of the organs are generally more developed on the right side than on the left side; but, considering that the left portion of the brain presides over the functions of the right part of the body, one might deduce that it is the left hemisphere of the brain which must be the most developed. A professor of Bordeaux, Doctor H. Fleury, recently affirmed a similar opinion, based on his contention that blood circulation is more active in the brain's left hemisphere than in the right hemisphere, because of the dissymmetrical divisions of the aortic arch.

Notwithstanding their rational appearance, these theories have not been confirmed by observation. With respect to the 287 skulls that I have measured, in choosing as a reference mark the vertical plane passing through the external occipital protuberance and the extension of the middle ridge of the nose bone, I have procured the following results:

Skulls where the right side predominates over the left side 125

Skulls where the left side predominates over the right side 111

Skulls whose various bones are unequal, but whose inequalities offset each other,
so that the right half is nearly the same as the left half 51

There is, as you can see, an advantage on behalf of the right side, but it is slight; and, in reality, the skull is sometimes more developed on the right--then again, sometimes on the

left--without it being possible to assign solid reasons for this inequality of development.

From the very first I have believed that the inequality of development of the homologous parts of the skull would be found more frequently on the left than on the right side among intelligent subjects; and observations made with the conformator (that is, the hatmakers' head-measuring instrument) on more than 200 living heads led me to instantly be persuaded in the accuracy of this hypothesis. But, I have discovered since then that by reason of the difficulty of successfully positioning the large axis of this instrument, one cannot rely upon its indications. I have in the meantime preserved in an album, which is available to anyone who might find it interesting, 200 drawings taken upon the living with the aid of a conformator.

What regions of the skull show the unequal development that I have pointed out? *A priori*, it will seem that it must manifest itself in the same sense for all the bones belonging to the same side; but observation will once again contradict this hypothesis. When, for example, the frontal bone predominates on the right, one very often sees the parietal predominating on the left, and vice versa. Whenever it happens that the parietal and the frontal predominate on the same side, one can be fairly certain that the occipital will predominate on the other.

Whenever the two halves of the skull seem equal, as in the third case mentioned in the preceding table, it is because the inequality and the irregularity of certain bones on one side have been compensated for by inequalities on the opposite side; the predominance of the parietal on the right, for example, will be offset by the predominance of the occipital on the left half, and the two halves of the skull will appear symmetrical; but, in none of the nearly 300 skulls that I have measured have I ever found all the corresponding parts of the right and left side equally developed.

The preceding observations demonstrate that the skull, and probably the brain as well whose shape it has reproduced from its own, presents a lack of constant symmetry *that is not of the same sense for each of its parts*. For now, messieurs, I shall confine myself to establishing this important anatomical fact, without trying to draw at this time any physiological inferences.

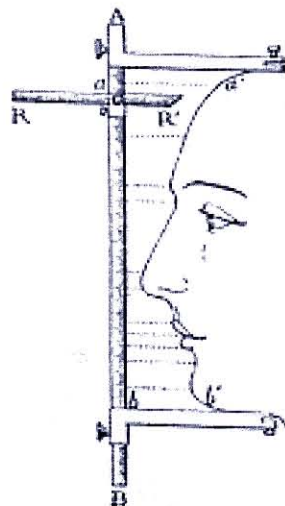
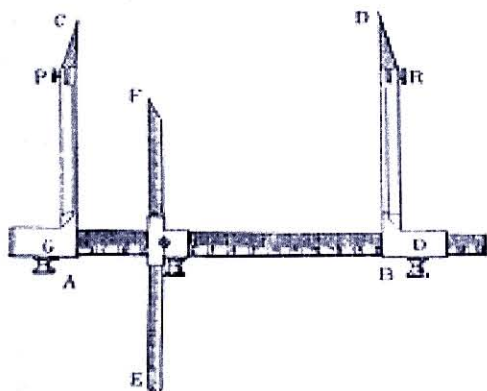
About a week prior to the next meeting Le Bon informed me that he would not be able to attend; nonetheless, he hoped I would stand in for him in case there was any special mention of his paper on his pocket cephalometer invention. I consented, of course, and consequently, to make me more conversant about the instrument and its features, the master provided me a private tutorial on its operation.

The very first, and most important, thing Le Bon taught me was how to quickly measure the subject's cephalic index. The antero-posterior diameter is found by laying the pocket cephalometer's left ruler on the glabella and then sliding the instrument's right ruler until it reaches the most prominent point of the occiput; the right ruler is similarly adjusted in measuring the skull's transverse diameter. It is all so easy. Well, in less than a minute my own cephalic index was precisely determined—79.8.

Now, at the meeting itself on the 21st, Doctor Broca acknowledged receipt of Le Bon's paper, and it was included in the Society's Bulletins for that date. Regrettably, nothing more was said about it, for Charles de Wffahy gave a talk about his travels in Kohistan, and the cephalic index measures he obtained of the inhabitants there were undoubtedly the product of a substantially greater effort than had he used the pocket cephalometer.

**The Pocket Cephalometer,
or
Compass of Coordinates,
Allowing One to Very Rapidly Obtain
the Diverse Diameters, Angles and
Profiles of the Head,
and
To Reproduce in 3-D Any Solid Figure**

BY: DR. GUSTAVE LE BON



**The Pocket Cephalometer,
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Compass of Coordinates,
Allowing One to Very Rapidly Obtain the Diverse
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I. DESCRIPTION OF THE INSTRUMENT.

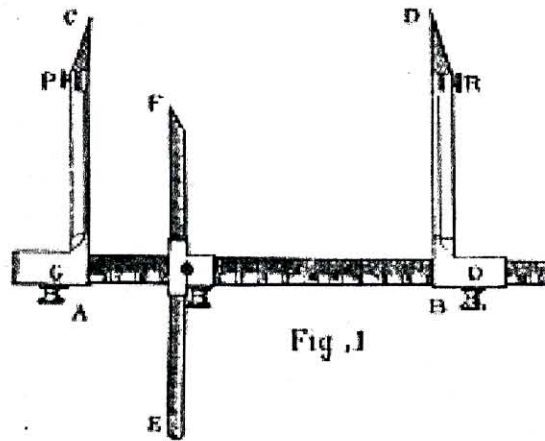
The instruments used up to now in anthropology laboratories to measure the diverse diameters, curves and angles of the head, either upon the living or upon skeletons, are complicated, expensive and by no means portable. What has resulted is that the majority of anthropological measurements have only been effectuated upon skeletons, and it is most rare to see a travelling scientist bring back any craniometric measures of races visited by him. Taking central Africa as an example, already thoroughly travelled through by many explorers, information on head measurements is wanting in a nearly absolute way.

A simple, inexpensive instrument, easy to handle and extremely portable would obviously render important services.

The instrument that I have fancied, and which has been manufactured from my designs by a master builder, Monsieur Molteni, entirely realizes the conditions that I have just enumerated. It is extremely portable being that, as will be demonstrated, it can be stored in a carry case possessing ordinary dimensions. Its operation and handling is very easy because only a few minutes of use is sufficient in order for one to succeed in supplying himself the desired information. Finally, its price is not at all high.

I have bestowed upon this cephalometer the name *compass of coordinates*, by reason of the geometric principles upon which it is founded. One knows that in analytic geometry coordinates are named for the elements which permit for the fixing of the position of a point or a series of points either upon a plane or in space. Given two axes set perpendicular to each other, the horizontal one or *axis of the abscissas*, the other or *axis of ordinates* being vertical, the position of various points are determined whenever one knows their distance from these two axes, that is to say, when one knows their abscissas and ordinates. These distances constitute the coordinates of these points. If one can imagine a third axis bisecting the two others, the position of a point in space can be determined if one knows its coordinates, meaning its distances from these three axes.

My pocket cephalometer, or *compass of coordinates* (see Figure 1), is composed of a 25 centimeters long steel ruler (AB), detachable at its center in a way so that it is able to be separated into two parts. Upon this ruler slide fairly friction-free two other vertical metallic rulers (AC and BD) of 12 centimeters height, susceptible to being immobilized by the tightening of each's screw, and a small graduated ruler (EF), possessing scale marks along its entire length; one can likewise immobilize ruler EF at a pinch. Rulers AC and BD only move in lateral directions; they are terminated at their



upper part by movable points C, D like those of a compass and which leave, when one removes them, grooves through which points C and D can be set by the pressure of a threaded screw. Small ruler EF, wholly possessing the lateral movement of the two others, and remaining like them perpendicular to the large ruler AB, is also endowed with top to bottom and bottom to top movements which give to it the possibility of sliding itself above the level of ruler AB. This double movement quality allows small ruler EF to follow the contours of a curve while always remaining constantly perpendicular to large ruler AB upon which it places itself. If, for example, one set with the threaded screw the two vertical rulers about the end points of the diameter of a cylinder, one would be able with the small ruler to pass across and carefully examine the entire half-circumference of this cylinder, with the small ruler being obliged to remain constantly in contact with the cylinder during this process. Because small ruler EF is graduated, it's sufficient to observe how many millimeters it has sunk down below or risen above the large ruler, assuming it has surveyed a given space, in order to obtain the ordinates of the different points of the curve, elements which will allow for the reconstructing of the shape on paper by very simple graphical methods.

Despite its simplicity, this process will take too long in actual practice; and, as I shall soon demonstrate, I have had no recourse but to complete the data-collecting by much more rapid means.

II. USAGE OF THE INSTRUMENT.

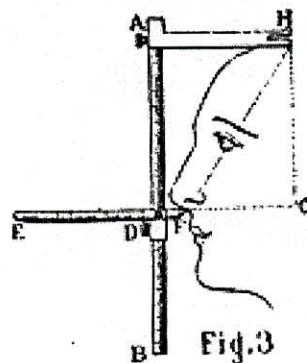
This pocket cephalometer permits one to immediately obtain all the diameters, curves, and cephalic angles of the head that one is in the habit of measuring. I shall now briefly indicate the manner of its usage.

As a general observation, I must point out that the small ruler's scale should be set even with and pressed lightly against the points where the rulers are coincident with the sought after divisions of the head (without taking into consideration projecting or recedeable parts that these divisions can contain and which, however, the design of the instrument compensates for). It is only necessary to take care to set on the left side vertical ruler AC which must be stationed on this side, and which to that end is indicated in Figure 1 by the letter G. As for the small ruler, it must be positioned in a way such that its pressure screw lies in front of the observer. Once the rulers are thus arranged, and the apparatus fixed in place, one can accurately determine the three main head measures on the same plane. Here now is the way in which the pocket cephalometer can be of service.

Diameters of the Head. -- The principal diameters that it is useful to measure on the head are, as one knows, the antero-posterior and transverse diameters and the vertical diameter. Because the first two can be calculated as easily upon the head as on the skull, one only needs to be careful in removing the points of the instrument whenever one operates upon the living. The vertical diameter is measured on a skeleton from the occipital foramen to the top of the skull; but, because the occipital foramen is not accessible on the living, one should take as a reference mark either the ear cavity or the top of the tragus's convexity. I believe that one can obtain an even more certain reference mark by choosing the lower rim of the middle partition of the nose, which pretty much corresponds from my observations to being even with the lower margin of the occipital foramen.

In order to measure the antero-posterior and transverse diameters of the head with the instrument, one must first lay the left branch (ruler AC), whose bottom edge must coincide with the zero mark of the horizontal ruler, on one of the end points of the diameter being measured, and then slide the other branch (ruler BD) until it reaches the other end point of the diameter. One now renders the instrument immobile with the pressure screw, and it only remains for one to read at the level reached by ruler BD's lower edge the number of millimeters indicated by the large ruler.

In order to obtain the vertical diameter, one first removes the right branch (ruler BD) and then places the left branch upon the top of the head. The large ruler being now in a quite vertical position, which with its upper knob a plumb line can be easily established, one next brings the small ruler even with the reference mark, that is to say, even with the ear cavity or, as I have recommended and as is indicated in Figure 3, even with the bottom rim of the nose. With the small ruler being held in place by the pressure screw, there is nothing more to do but to read on the large ruler the number of millimeters indicated: this number represents the vertical height sought.



I have to remark that this instrument is the only one, outside of the bulky instruments in the laboratories that can only collect data there, which enables the vertical height of the head to be measured. It might seem at first sight that this measurement can be effectuated with calipers; but, it is sufficient to reflect for but an instant in order to realize that this idea is quite impossible. In fact, it is evident that the top of the skull and the ear cavity, where the lower part of the nose acts as the reference mark, are not in the same plane; their distance measured by calipers is an oblique line--such as FH (in Figure 3), hypotenuse of right triangle FHO whose vertical side HO represents the height of the skull, a height that can clearly be determined because length $AD=HO$, and AD is produced and shown by my instrument.

The height of the head substantially influences its volume, and in anthropology this fact is of considerable importance. It is obvious that the volume of a solid substance, such as a cylinder for example, can only be evaluated by knowing its height. It is simply the difficulty of measuring this height upon the living that has caused it to be neglected up till now.¹ Although my instrument is mainly intended to collect measurements upon the living, I should point out that one can employ it on the skull with as much ease as if one used calipers. By reason of the length and height of its sections the pocket cephalometer can, in fact, attain all the points that are accessible to calipers. It accommodates, for example, being inclined a little to the right or the left in the taking of the diameter proceeding from the lower edge of the occipital foramen to the nasofrontal seam, a diameter which appears at first sight, because of the projection of the nose bone, unattainable for an instrument possessing parallel sections.

Measurement of Cephalic Angles. -- The most commonly used of the cephalic angles is the facial angle of Camper. It is determined, as one is aware, by the intersection of two lines, one being horizontal, running from the ear cavity to the lower part of the nostrils, the other being more or less inclined upon the first, passing through the most projecting point on the forehead and the lower portion of the nose's dividing membrane. With various observers this latter reference mark is replaced either by the lower edge of the alveolar ridge or by the part of the face which juts out the most.

As I shall soon proceed to explain, because the pocket cephalometer enables one to obtain an exact profile of the head, nothing is more simple than to measure upon this profile with a protractor, like one does on the profiles of skulls sketched in craniography, the facial angle and the various cephalic angles having the ear cavity for a reference mark, such as the auricular frontal angle, for example.

If one desires to limit himself to determining the facial angle of a person without bothering to obtain his profile, this can be easily accomplished by the following operation. It will be sufficient, given the instrument's precise capability of measuring the vertical height of the head, to measure the distances existing 1) between the ear cavity and the lower portion of the nose's dividing membrane, 2) between the ear cavity and the most projecting part of the forehead, and finally 3) between this latter point and the lower part of the nostrils. These three lengths represent the sides of a triangle that one can then construct and draw on paper by elementary geometric methods, and upon which one may measure the angle sought.

For the reason already mentioned above, it will once again prove quite impossible, as one might propose in error, to determine with calipers the lengths destined to serve as the basis of the preceding triangle. The facial angle, in fact, is contained in the middle plane of the head--an inaccessible plane--but still my instrument supplies the projection. The distances that separate the forehead and nose from the ear, taken with ordinary calipers, represent the sides of an oblique plane--sides naturally longer than those obtained in the vertical plane.

¹ During the meeting of the Anthropology Society where I first introduced the members to my pocket cephalometer, a learned traveller, Monsieur de Ujfalvy, presented to the Society a great number of cephalic measurements of races examined by him; but, lacking portable instruments the vertical height of the head was unable to be measured. At this same meeting Colonel Duhousset told me that the usefulness of knowing this height had led him to build a special instrument so that he could measure it.

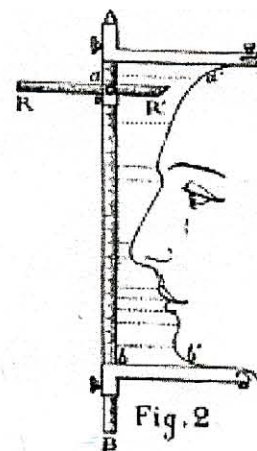
Measurement of the Profile and Circumference of the Head. -- One may be able with this cephalometer to construct and draw point by point the profile of any region of the head, by trying to find, with the help of the small movable ruler and the two other stationary ones, the ordinates of each of these points; but, this approach is slow and tedious. I resort to other means, as I have stated, to determine the various points of the face that I wish to know exactly.

In order to obtain an exact profile of the head and face, I operate in the following manner: having retracted the small ruler and the two points that terminate the extremities of the two branches (rulers AC and BD) of the instrument, and opening as widely apart as possible the latter, the subject's head is inserted perpendicularly inside the restraint that terminates the right branch; I then set with the pressure screw a thin lead strip of 1 millimeter thickness, 5 millimeters width, and 60 centimeters length upon this branch's lower extremity. Next, with the right hand applying the extremity of this branch upon the nape of the neck at a point even with the external occipital protuberance, one can now follow and pursue with the lead strip held in the left hand all the contours of the head as far as the top of the nose. Having arrived at this point, one exercises caution by making sure to pass the strip over the face in such a way that it does not squish down the soft parts that are unable to resist its pressure; exercising such caution, one continues on a little farther, bringing the strip under the chin as far as the neckline. The strip's end is then set by means of the second branch of the compass, producing a suitable end point. With the branches of the instrument being now immobilized in a definitive fashion, I withdraw the cephalometer from the head, and the lead strip fastened at the two branches' extremities in an invariable way is now placed upon a sheet of paper. It only remains to follow with a pencil the circuit created by the lower edge of the strip in order to accurately obtain, minus the details of the face (which one can complete, as I shall soon reveal), the contour of the head. One can assure himself by repeating this operation several times that the lead strip perfectly preserves the contours upon which it is molded.

The entire circumference of the skull and its transverse curve can be taken in the same way with a thin lead strip. The curved line formed by the latter is held in place at the two end points of its diameter by the branches of the compass.

The only inconveniences the lead strips present are the darkening of the skin a little bit and their sometimes snapping and breaking, which can happen if one does not take the precaution of passing them through the flame of a gas lamp in order to anneal them whenever they have been in use for some time. I have conducted research to see if they could be replaced, but I have not found anything quite as satisfactory. Iron wire of 1 millimeter thickness covered with silk, like the kind employed to conduct electrical currents, and pure silver wire having a diameter of $\frac{1}{3}$ millimeter are, after the strips of lead, what seems to me best to use.

Profile of the Face. -- By means of the preceding operation one obtains the exact contour of the head, but not that of the face. Should one have an interest in obtaining the latter, which is useful notably in precisely determining the degree of prognathism (more or less great) of the various races, I suggest one proceed in the following way, which is to apply the previously expounded principles of analytic geometry. Supposing that the head is secured between the two branches of the instrument in the manner indicated by Figure 2. It is evident that learning the



ordinates of the main points of the different parts of the curve included between aa' and bb' as well as their reciprocal distances from one another will permit one to discover the points through which this profile must pass. Nothing is easier than to obtain with small ruler RR' the length of lines aa' , etc. One acquires these lengths by merely touching with small ruler RR' each of the projecting points of the face (a dozen is enough), and, when this ruler is even with each of them, you can then dictate to an aide the two numbers indicated, one being how much the point is elevated above the large ruler, the other being at what distance from zero it finds itself on this same ruler. A piece of paper, preferably graph paper, is now readied. For there is nothing more to do but to set up on a horizontal line a series of parallel lines showing in millimeters their lengths and respective intervals as expressed by the preceding numbers, in order to obtain with the most rigorous precision the points through which must pass the curve that constitutes the profile of the face; by carrying out this procedure, the profile of the entire head, already largely obtained, is now complete. Finally, in order to have in place all the elements necessary for anthropometric research, one needs to mark upon the drawing the position of the ear cavity at the point where two circular arcs traced with a compass intersect each other, arcs whose radii have for spacing the length measured with the cephalometer from the ear cavity to any two points of the face.

To summarize, all these operations which we have just described at length are executed very rapidly, and they are accomplished with an instrument that is extremely easy to carry in a small bag. One quickly obtains, and above all more precisely than what could be made by a good draughtsman, the exact profile of the face and head; and, as has been demonstrated, all the measurements anthropology finds useful can readily be taken as well. By comparing these highly accurate profiles to those that you see an artist create, however skillful you and others might suppose this person to be, you will recognize and perceive the extent to which freehand drawings always deviate from reality.

III. APPLICATIONS OF THE INSTRUMENT TO THE SOLUTION OF DIVERSE PROBLEMS AND TO THE REPRODUCTION IN 3-D OF SOLID FIGURES.

Concerning these aforementioned applications of the pocket cephalometer, my instrument enables one to resolve a great number of interesting geometric problems, such as those, for example, relating to the curve that originates from the section of a solid figure which has been cut through by a plane. Concerning this section, it is easy to see that with the solid having been grasped between the two branches (rulers AC and BD) of the instrument, and the small movable ruler being promenaded over the solid figure in such a way that it constantly remains tangent to it, one acquires, with the help of the cephalometer's scale marks, a system of ordinates that leads, by a very simple graphical construction, to the procurement of the curve formed upon the solid by the plane that intersects it. Hence, one can prove experimentally that the curve created by a plane passing through any section of a cone, for example, is either a circle, an ellipse, a parabola, or a hyperbola, depending on the inclination of this plane.

This instrument therefore allows one to reconstruct graphically by means of the Cartesian coordinate system the curve generated on a solid figure by the intersection of a plane. But it is easy to see that any solid may be regarded as an object constituted by the superposition of an infinite number of horizontal planes. It is obvious, for example, that if you cut up the head into a series of equally spaced horizontal slices, it would then be sufficient to layer all these slices upon one another in the same order of their sectioning in order to restore this head. Now that we have seen that the instrument can produce an exact copy of each of these horizontal slices, nothing will be easier than to

reproduce the solid figure itself. It will suffice, assuming the instrument has been properly fitted upon a movable vertical support, to capture the profile of the figure's sections millimeter by millimeter by transferring and putting them on cardboard strips of 1 millimeter thickness, then cutting these strips according to the contour indicated, and finally to superpose them. It is clear that these layered strips will yield a solid figure which will be an exact reproduction of the model.

Carried out in the manner that I have just described, the operation, very simple in theory, will prove exceedingly slow to perform in practice. In order to render this operation easier, I have invented a second instrument, founded upon the same geometric principles as the preceding, but which allows one to ascertain nearly instantaneously the contours of solid figures. As a result, this second instrument produces the series of horizontal profiles whose superposition enables one to reconstitute the solid figure. It also permits one to more rapidly take the profile of the head and visage than does the pocket cephalometer, but it is a little bit more costly, and mainly less portable.

Figure 4, which shows the instrument applied on the head so as to determine the profile, makes much more understandable the device's fundamental principles. It is composed of three copper frames, each formed of two thin and parallel metal plates that can be tightened with a pressure screw. Between these plates slide quite frictionlessly parallel metallic rods that are perfectly cylindrical; each of these rods is 20 centimeters long by 2 millimeters wide.



Fig. 4

By a mechanical artifice whose description would entail far too much, we have gotten, on the one hand, the rods to remain constantly parallel to themselves, and on the other, not allowed the rods to sag or get entangled with one another whenever one loosens the two frames that keep them together. It was above all this twofold inconvenience involving the rods that long ago made us renounce use of the instrument named *profilemeter*, which moreover only gives the profile of the face, whereas my new instrument furnishes the profile of the entire head, as one can see in Figure 4. To obtain this profile, one need only tighten the screw in order to keep the rods immobile, and then

place the frame flat upon a sheet of paper, following the contour of the rods with a pencil. Prior to these last two steps, one should see to it that this sheet of paper is laid upon a piece of cardboard sufficiently thick in order to compensate for the thickness of the frame, and done so in such a way that the metallic rods find themselves entirely even with the paper.

Let's suppose that we now want to adapt the instrument to perform a three-dimensional (3-D) reproduction of a solid figure, the head for example. I have demonstrated above that by layering a sufficient number of horizontal profiles of a solid figure, one is able to reproduce this form. Nothing remains then but to indicate how to operate this instrument. It is very easy to use. The upper frame is first fitted flat upon the end of a graduated vertical shaft, and then can be lowered at pleasure down the shaft toward a solid support mounted at the base. With the head being held steady by means of a headrest similar to those used by photographers, one next takes horizontally (in the Figure 4 drawing, the instrument, having been positioned to obtain the vertical profile of the head, is disposed vertically)

at equal distances of every 2 millimeters, for example, the horizontal profiles of the head. The curves thus acquired are transferred by pencil onto thin cardboard sheets which, when cut out, themselves serve as patterns for cutting up slices of clay, wax or similar substances having exactly the preceding thickness. In superposing in correct order all these layers, each one of which is naturally composed of two reference marks, there is nothing more to do but to smooth out some angles with a chisel or file in order to obtain a copy of the head. With two frames and an assistant, who with pencil transfers onto cardboard an obtained profile while the operator takes another profile, one can proceed most rapidly.

I must point out that, even for a skillful artist who prefers to make copies from nature, the preceding instrument will always prove useful, because it is the only device that enables one to verify whether a derived region is completely conformable to the original. The instrument having been, in fact, applied upon the part being examined must, when one applies it upon the same region of the copy, follow the contours exactly.

As one can with a pantograph enlarge or reduce at will each drawing of the profiles procured by the above method, one sees that one may obtain with great precision a 3-D copy enlarged or reduced from the original.

Outside of these applications to sculpture, this apparatus allows one to easily solve various important geometric problems, particularly making immediately apparent what the curve is on any solid, cylinder, cone, ellipsoid, etc., that has been brought about by the intersection of a plane.

The preceding instrument is, I believe, the first ever that permits one to obtain a life-size 3-D reproduction, which can be reduced or enlarged, of a person's head. The utilization of a lathe to obtain enlarged or reduced copies of statues is not a feasible approach upon the living. Meanwhile, photosculpture is nothing but an unrealizable theoretical concept. As for the device invented forty years ago by the mechanical engineer, Monsieur Sauvage, which is composed of a sort of cylinder filled with knitting needles, into which the person doing the molding would plunge the object, one cannot employ it upon living beings. Not surprisingly, this apparatus, besides being very expensive as well as possessing the limitation of enabling one to only reproduce a single side of the head or any other solid object, has rapidly sunk into oblivion.

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The two instruments that I have described at length--the pocket cephalometer and my 3-D copy invention--appeared at the Universal Exposition in the anthropological sciences section. With their low price putting them well within reach of most people's pocketbook, they will render, I hope, as much service to artists as to museums of anthropology. They constitute a new application of the graphical methods so much in use nowadays among physicians, mathematicians, and physiologists.

“A Journey of Exploration in Kohistan”

by Charles de Ujfalvy

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 21, 1878

Between the basin of the Syr Darya River and that of the Amu Darya River exists a considerable depression. This depression contains the course of the Zarafshan River, whose upper part in the old days was called Kohistan.

The upper valley of the Zarafshan is encased by tall mountains; it is almost inaccessible, and the authority of the emirs of Bukhara has never been recognized in an absolute way by the rough mountain people of this country. Kohistan comprises the region lying between the Turkestan Range and the Hissar Mountains, that is to say, the upper course of the Zarafshan and the basin of the Fan Darya River, whose sources lie beyond Lake Iskander and its tributary the Iagnob River. The valleys of the Fan and Iagnob are separated from Zarafshan Valley by the Zarafshan mountain chain. This country has been inhabited from the most ancient times by the Galchas, also known as the mountain Tajiks. Of Iranian stock the Galchas are subdivided into six tribes:

1. The *Moghiyons*, inhabiting the area from Panjakent to Moghiyon.
2. The *Kshtuts*, residing in the valley of the same name.
3. The *Falghars*, living along the right bank of the Zarafshan River from Panjakent to just beyond Urmetan.
4. The *Matchas*, from Warsiminor up to the sources of the Zarafshan.
5. The *Fans*, occupying the Fan Darya Valley and the area around Lake Iskander.
6. The *Iagnobs*, living in the valley of the same name (tributary of the Fan Darya).

The Galchas are tall in height and are of average weight. Their skin is white, and though often bronzed by the sun, the covered parts are white; it is either very hairy or a little hairy, but never smooth. Their hair is black, chestnut brown (mainly among the Fans), sometimes reddish colored and often blond; it is sleek, wavy and curly. The beard is full, brown, reddish brown or blond (in a village near Panjakent, there are two brothers with hair as white as linen). Their eyes, never turned up in the corners, are brown, frequently blue as well. The nose of the Galchas is very well-shaped; it is long, slightly curved and slender. Their lips are nearly always thin and straight; their teeth are small and often worn down, on account of abuse sustained from eating dried fruit. The forehead is high and recedes somewhat, with the brow ridges being quite pronounced; the transverse depression separating the nose from the glabella is deep, while the eyebrows are curved and sufficient. The

mouth of the Galchas is small, the chin and the whole face are oval-shaped, with the ears being small or average-sized and flat (only rarely do they stick out). Their body is muscular, vigorous, and exceedingly well-built; their hands and feet are much larger than those of the plains-dwelling Tajiks and much larger still than those of the Kirghiz and Tatars. The appendages are fine-looking, with the calf muscle being sinewy and the legs straight and well made. Their figure is generally slender; the trunk is solid and the neck strong. The Galchas are very robust, excellent walkers, sufficiently good horsemen, and able to endure fatigue. With regard to maladies experienced by these people, ophthalmias frequently occur, while some Galchas suffer from kidney or bladder stones; there are villages in which nearly all the inhabitants are afflicted by rheumatism of the joints, which I attribute to a mixture of curdled milk and a kind of root that they regularly consume.

Here then is the breakdown of the measurements that I took on 58 individuals in Kohistan.

Hair. -- 31 sleek, 25 wavy, 2 curly.

Beard. -- 39 full, 13 sparse, 4 nonexistent, 2 almost nonexistent.

Skin. -- 39 a little hairy, 15 very hairy, 3 smooth, 1 nearly smooth.

Lips. -- 31 thin, 24 medium-sized, 3 thick.

Teeth. -- 30 average-sized, 28 small.

Teeth. -- 30 good condition, 16 worn out, 17 diseased.

Incisors. -- 56 vertical, 1 a little oblique.

Shape and size of the nose. -- 37 curved, 23 long, 19 medium length, 7 short, 11 large, 8 straight, 15 pleasingly slender.

Skin (bare parts). -- 28 bronzed by the sun, 15 white, 15 deep yellowish.

Hair. -- 32 black, 12 chestnut brown, 9 blond, 5 gray (2 of whom were formerly blond).

Beard. -- 23 blond, 12 black, 12 chestnut brown, 6 gray.

Eyes. -- 29 brown, 12 dark-colored, 10 blue, 6 green, 1 gray.

The Galchas are still in possession of certain usages which call to mind those of the Zoroastrians. Never does any Galcha ever blow out a lamp, for these mountain people regard the breath of man as impure--that is to say, it must not impart itself on the flame, the purest thing in existence. They are considerably more honest and frank, and above all less servile and obsequious than the Tajiks of Samarkand. Each village is administered by an *Aksakal* (or headman), and many localities are under the jurisdiction of a *Kazi*. The main towns are: Soudjana, located a few kilometers from Panjakent, possessing some small spinning-mills; Urmetan, built alongside the ruins of an ancient Bukharan fort; Warsiminor, at the confluence of the Fan Darya and the Zarafshan;

Dastioburden and Paldorak, in the Zarafshan Valley, and Sarvada, in that of the Fan. The population of the Iagnob Valley is particularly interesting, because it inhabits a virtually inaccessible region and it speaks a language that is not understood by the neighboring peoples.

The mountains which encase the Zarafshan Valley are barren and steep; the valley itself, extremely fertile, is adorned with beautiful vegetation. On the left bank one comes upon juniper trees and bushes of all species. The ground is schistose or pebbly, and abounds in minerals. The pastures lying on the flanks of the mountains are excellent for livestock. In general, the climate is temperate; it is not as warm as Samarkand, and the tall mountains of Turkestan shield it from the cold north winds of winter. Transmitting messages in this country is exceedingly difficult. There are no practicable paths for horsemen or beasts of burden; often even pedestrians might find themselves at risk. Such paths, dangerous at times, extend: to the north, to Ura-Tyube; to the west, to Panjakent; to the south, into the Karategin and Hissar mountain ranges. Not surprisingly, commerce amounts to but a trickle. The inhabitants export dried fruit; additionally, with the aid of the Zarafshan they float timber down the river as far as Dachti-Kazi, and from there, employing donkeys, they drag the logs to Panjakent and even to Samarkand. One finds coal mines in Kohistan, as well as a type of root for tanning and another which emits an agreeable fragrance. The people here make white linen cloth that is sufficiently strong, and also a kind of sweet-tasting flour made with fruit from the mulberry tree. They are farmers and raise livestock. Their homes are built out of wood and stone, and their tents, which only serve them in the summertime when they accompany their flocks into the mountains, are made of felt. Cultivated fields are commonplace, and the orchards around the hamlets contain numerous fruit trees. All varieties of wheat and alfalfa thrive here, and the many different fruits are quite savory. Within the smallest valleys one notices irrigation canals skirting the inclines of the mountains and enabling sometimes even the highest grounds to be fertile. Everywhere there are bridges of a rather primitive construction, but always they are solid and well laid out. All that I witnessed there substantiates the fact that these mountain people have been farmers and sedentary since the most remote times. I believe therefore that we are dealing with an autochthonous people who long ago were driven into the mountains by Turko-Mongol invaders.

Finally, I do not know how to conclude this brief description of my journey to Kohistan without recognizing the services that the work of Monsieur Girard de Rialle on Central Asia rendered me. It is a valuable guide which I continuously followed for the better.

DISCUSSION

Monsieur ABEL HOVELACQUE. I would like to point out, Monsieur de Ujfalvy, that the fire cult presently in favor with the populations that you visited is in harmony with the traditions of the Iranian populations.

Doctor PAUL TOPINARD. I see that the agenda for today's meeting is full; so, I shall restrict myself to making an observation which comes to mind in view of the average cephalic index of the Galchas, as determined by Monsieur de Ujfalvy, being so high.

Undoubtedly, this index is not quite as high as it seems, the reason being that it had been taken on living subjects and therefore, according to Doctor Broca's research, it ought to be lowered

by about 1½ units. Nonetheless, I have in my hands another series of measurements of Iranians that you took in Fergana, Monsieur de Ujfalvy, and consistently you obtained cephalic index measures of 84, 85, and 86. Hence, I believe one may from now on conclude that today's diverse representatives of the ancient Iranian race are ultrabrachycephalics. This then, fellow members, is one of the most important results of the mission fulfilled with such dedication to the profit of anthropology by our colleague. One could only conjecture it up to now; but, thanks to Monsieur de Ujfalvy, the inference has been proved--that those who we call Iranians (based on linguistics) are highly brachycephalic.

Now, where else can one encounter brachycephalism as accentuated, brachycephalics like these possessing no Mongoloid traits, but rather having Caucasoid traits? In Europe and only in Europe. We have in France notably brachycephalics with a no less extraordinarily high average cephalic index. They belong to the Celtic race, whose division comprising the people of Auvergne was formerly believed to be the most accentuated with respect to brachycephalism (index of 84), but which at present, according to the presentation made here a while ago by Monsieur Hovelacque, appears to be the Savoyard division (index of 85). On the occasion of Monsieur Hovelacque's presentation, I noted that from the tip of the Armorican peninsula in Brittany down to Savoy, in passing through Charente, Nièvre, Aveyron and Auvergne, there exists a compact striplike zone whose cephalic index keeps on increasing. Moreover, I added that beyond the Alps, in all of Austria and farther still in Russia, one will encounter additional brachycephalics possessing high indices. I also said that, amongst the skulls kept in our Museum, the more neighboring Auvergne skull shares many affinities with the Serbo-Croat skull. Lastly, I wondered if the Celts of the West were none other than the Slavs of the East (whose indices, according to Monsieur Weisbach, range from 82 to 85).

Well, Monsieur de Ujfalvy, given the results of the measurements you took on the Aryan brachycephalics of the Pamirs, I shall proceed further and ask if these mountain people are not in reality but the third link of an uninterrupted chain which extends all the way from the Armorican peninsula into Central Asia. Obviously, there exist differences among these three types of brachycephalics, but they can be accounted for within certain limits by environmental influences and in great part by the impact of interbreeding with the indigenous populations of each region. To conclude, I must remind you that the bulk of the European brachycephalics, to which I have seen to make allusion, settled here in western Europe during the course of the Mesolithic Age after having made its initial appearance during the Paleolithic Age (as evidenced by the skulls of Truchere and Grenelle).

Monsieur CHARLES DE UJFALVY. I must point out that all the populations in the regions that I traversed are brachycephalics.

THE SECRETARY GENERAL AND FOUNDER OF THE SOCIETY (Doctor PAUL BROCA). Also, the predominance of the blond color of the hair of these populations is a fact to note.

Monsieur ABEL HOVELACQUE. From what you said, Monsieur de Ujfalvy, the Mongoloid populations are less brachycephalic than the non-Mongoloid populations. This assertion is well-founded. The Mongols are at most sub-brachycephalics.

Doctor PAUL TOPINARD. I have been appointed as the reporter for a committee charged

with the task of examining all the measurements taken by Monsieur de Ujfalvy on the different races of Turkestan, and already I have been able to look over the data. Well, the numbers reveal that there are some dolichocephalics and sub-dolichocephalics. I recall among other things seeing indices below 69. Additionally, my attention has been drawn for a long time on the only three skulls of Kashgarians that, to my knowledge, we are in possession of in the West. These skulls from Kashgar comprise part of the collection of Monsieur Barnard Davis. Two have a cephalic index of 71 and 74. These therefore are irrecusable cases of dolichocephalism manifesting itself upon the borders of Pamir.

This shape of the head makes one involuntarily think of blonds with blue or lightly-colored eyes, and, in fact, such persons for a long time have been inhabiting the neighboring region of Kafiristan or, more accurately, Dardistan. Now, this leads us to the question that needs to be answered. It turns out that dolichocephalism in Europe is the usual accompaniment of blond hair, blue eyes, and tall height; except among the Finns in northern Russia and with some groups in the Mediterranean region, these three or four qualities make their appearance together. Here then is a thought one might logically express: between the blond dolichocephalics of Europe and the blond dolichocephalics of Turkestan, a relation will be found to exist. The following consideration supports this viewpoint. From the Caucasus to the banks of the Rhine a trail of burial mounds and other forms of sepulchers exist. In the Ukraine, Galicia, and Bohemia the tumuli date from the Bronze Age, while the others to the East belong to the Mesolithic Age, as if the race that constructed them had acquired bronze during its westward journey. In the Bohemian zone these burial mounds are scattered; they increase as one goes north towards the Vistula, then decrease again, and possess dates that are lost with those of history. Undoubtedly, a great number of them can be attributed in a way to the Swedes, Germans, and Franks. Now, each category of these tumuli contains either dolichocephalics exclusively or dolichocephalics mixed with brachycephalics, that is to say, with the population types that this dolichocephalic migration would have encountered on its passage. It is, accordingly, easy to give a name to these migrants: they are the Cimmerians of Hippocrates and Herodotus. Some of them deformed the head in various ways, of which three such examples can be seen in our Museum. This very custom penetrated into France, notably with the Arecomici and Tectosages (tribes of the Volcae) belonging to the grand confederation of the Belgae, a fact which furnishes, moreover, evidence of the relation of the dolichocephalic blonds of western Europe with the Cimmerians of the Caucasus and the Crimea.

But before the Caucasus, what were the lands occupied by the Cimmerians? Well, firstly I shall remind you that mountains are the habitual refuge of vanquished, on-the-run people; it is here that we anthropologists exercise the practice of searching for traces of earlier tribes. Did the Cimmerians therefore originally reach the Caucasus from the North or from the South? I do not know, but the isolated dolichocephalics and blonds that we find today in the Pamirs are thought to have come from the South. These scanty pieces of evidence, according to this hypothesis, represent cases of atavism of a very ancient race which would have lived in these parts, and which would have faded and been absorbed over time by a predominant brachycephalic element.

One knows that crossbreedings have the effect of dissociating physical qualities. Succeeding generations present the dolichocephaly, for example, of the early race among some of the descendants, blond hair or blue eyes in others, and tall height elsewhere. Certain qualities are more easily preserved, appear singly or in pairs, or on the contrary are neutralized by other contradictory

qualities. Well, here is what I am arriving at, messieurs: these scattered cases of dolichocephaly in the midst of pronounced brachycephalics, without an intermediate cephalic index establishing a mutual connection, as well as the similarly dispersed cases of blond hair and blue eyes that we find in the Pamirs, will not these prove to be none other than the dissociated elements of an anterior race, completely blond and dolichocephalic, like the Cimmerians of the Caucasus or our northern European blonds?

The doctrine, messieurs, that I have enunciated just now concerning the kinship of the Iranian, Slavic, and Celtic brachycephalics seems to me almost a certainty; the idea that I have expressed about the relation existing between the blonds of Europe and those of Asia is only a hypothesis which the future will decide. It is also possible that the primitive center of the blonds lies somewhere else, and that the blonds that one finds in the Pamirs are only in the manner of, and are not related to, the blonds of the Atlas Mountains. Nevertheless, the question merits being posed.

One of the year's best talks took place on June 20th. Professor Paolo Mantegazza from Florence related his findings concerning the atrophy of wisdom teeth, a topic that was timely for me, as the month before I had survived the extraction of the third molar on my upper left jaw ("survived" being not far from the truth, for a serious infection that took me quite a while to shake off had set in afterwards).

With good reason Doctor Magitot led a spirited Discussion following Mantegazza's talk; he was all but compelled to strongly defend his own research on wisdom teeth, which Mantegazza insinuated was lacking. As you yourself witnessed so many times at the Society's meetings, the issue in debate boiled down to a matter of interpretation. Both Magitot and Mantegazza acknowledged the same facts, but differed in the conclusions they reached. The membership also appeared equally split over the matter; Broca weighed in on Mantegazza's side, while Hovelacque and Dally offered certain criticisms of the Italian's work. Naturally, Madame Royer was her usual "helpful" self, suggesting to Mantegazza that he perform various clarifying studies that would only take two lifetimes to complete.

All in all, a most stimulating meeting, the way scientific get togethers once were (in contrast to today's boring, lifeless affairs).

“Concerning the Atrophy and Absence of Wisdom Teeth”

by Professor Paolo Mantegazza

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of June 20, 1878

In his book, *The Descent of Man*, Monsieur Darwin expresses the opinion that the third molar unquestionably possesses the tendency to disappear; according to him, we shall witness over the millennia the progressive decline of this organ. He only devotes half a page to the development of this idea which, moreover, he presents as but a conjecture. He emphasizes the weaknesses and defects of this tooth, which is the last one to emerge but the first to perish, often develops cavities and is frequently missing.

The celebrated biologist, Richard Owen, asserts that among the inferior races this tooth has three roots, whereas only two such roots are found in the superior races.

Since Darwin, no one has highlighted this question. Even our colleague, Doctor Magitot, who in his *Anomalies du système dentaire* reveals so many new facts, places no special emphasis on this problem.

Additionally, Monsieur Lambert, in a pamphlet which justly treats the dental system from the viewpoint of Darwinian theory, completely neglects this matter.

I have attempted to shed light on this question by examining skulls belonging to the anthropology museum which I have established in Florence. As of now, this museum, which is very new, only contains 2500 skulls, and because old teeth fall out and disappear with great facility, I have only been able to utilize a thousand skulls.

I have divided them into three series:

1. Ancient skulls (Etruscans, Phoenicians and Romans); I do not have any prehistorics.
2. Modern skulls belonging to the totally inferior races (Negroes, Papuans, Australian aborigines, etc.).
3. Modern skulls of the superior races; these are mainly those of Italians.

The comparison of these three series confirms the conjecture of Darwin and contrariwise invalidates the opinion of Owen.

If one considers en bloc all the anomalies (absence, atrophy, and ectopy) pertaining to wisdom teeth, one finds that among the superior races they are the rule; with the inferior races, however, they only constitute the exception.

This law is verified even more so if, instead of considering all the anomalies en bloc, one specifically takes notice of the absence of the wisdom tooth.

With regard to the ancient races, they are not represented in my museum by skulls sufficiently old enough in order to provide very characteristic results. However, it appears that they act as a transition between the superior and inferior races.

If then the conjecture of Monsieur Darwin might appear audacious even today, it finds in my observations an argument in its favor.

I have observed, moreover, that the absence of wisdom teeth is often a hereditary phenomenon. For example, in the Romagnese, an extremely brachycephalic race in which very strong traces of Gallic blood have been bequeathed, the absence of the third molar is the rule. My series of skulls are not numerous enough in order for me to be able to research whether there is a connection between the absence of this tooth and brachycephalism.

As for the opinion of Monsieur Owen, my observations found it in error. Among Italians, in fact, the third molar frequently has three roots; several times I have discovered four, and on one occasion there were five. It is therefore not correct, as far as Italy is concerned, to say that the superior races have fewer roots to their wisdom teeth than the inferior races.

DISCUSSION

Doctor ÉMILE MAGITOT. Professor Mantegazza, you raised two distinct questions in your presentation: one concerned the evolution of the lower wisdom tooth in human races; the other related to the number of its roots. Each of them yielded a certain observation.

In the first place it's important to know if, after having identified the absence of this tooth in an adult, you took the trouble to pry into the interior of the bone in order to learn if at least the embryo or follicle of this tooth was in place. I have personally conducted this research on many occasions, and always I have been able to discover the existence of this embryo whose development finds itself impeded by conditions of compression. Therefore one cannot conclude from superficial examinations, without dissection, that this tooth is absent.

In my opinion, the presence of wisdom teeth in the adult is intimately linked to prognathism and brachycephalism. If the wisdom tooth is more frequently missing in the relatively orthognathous white races, this is owing to the insufficiency of space and to its resulting atrophy; but its existence at any rate seems to me unchanged.

Moreover, in considering the form itself of this particular tooth, it is not wise to put one's trust in appearances. Undoubtedly, at first sight the wisdom tooth seems only to show a single root; but if one inspects it more closely, one readily discovers that the law of multiple roots for molars is by no means violated here. The roots, in reality, normal in number, are merely soldered by a coalescence-like phenomenon. This is what has impelled the anatomists to say with reason that the roots of molars must be distinguished from both the anatomical and surgical point of view.

Anatomically, the number of roots is fixed; surgically, this number may be reduced to one in the case of complete coalescence.

To sum up, I have to say that absolutely the lower wisdom tooth is never missing in any race. Its development and above all its eruption are just retarded or arrested in this latter case by reason of an energetic compression; further, although its embryo might completely atrophy, from an attentive examination one is always able to recognize its trace.

It is because of this conviction that, in my *Traité des anomalies du système dentaire*, which you alluded to, Professor Mantegazza, I did not take up this question of the disappearance of the lower wisdom tooth in the elevated races, as this disappearance was in contradiction with the facts that I have pointed out and also with the general laws of evolution of the dentition in man.

Professor PAOLO MANTEGAZZA. I anticipated your two concerns, Doctor Magitot, and have addressed them in my formal treatise on this subject.

Every time that the third molar was found missing in the skull's upper jawbone, I trepanned the maxilla in order to see whether or not the follicle existed; and, I noted the result in my findings. It is because it is impossible to conduct such research upon live subjects that I was limited to the study of skulls.

Finally, I have taken pains to clearly indicate in my findings the coalescence of roots, and their more or less complete fusion.

THE SECRETARY GENERAL OF THE SOCIETY (Doctor PAUL BROCA). The conclusions of your remarkable research, Professor Mantegazza, conform to those that my own observations provided; my findings are consigned in my registers, but I have not yet synthesized them into statistical form. Nevertheless, the impression that they left on me strengthens my belief that Monsieur Darwin had good reason to regard the wisdom tooth as an organ in decline among men.

It often turns out, as you stated, Doctor Magitot, that in situations where this tooth appears totally absent it merely rests enclosed in its socket. But this fact itself is proof of decline.

Also, this tooth often develops, though out of position; in this instance it frequently gives rise to pathological cases, causing suffering and injury. But, what is by far the most common physiological occurrence in our race is that the wisdom tooth does not develop at all.

In this case, by trepanning the bone one often finds a hollow spot which denotes the location of the tooth's follicle. This state of atrophy of the embryo of the wisdom tooth is quite commonplace; perhaps it accounts for all the cases reported of this tooth's absence. It is true that many times I have not found any hollow area which might be concealing the dental follicle, but this is maybe because the arrested development occurred at a time when the embryo was extremely small.

You informed us, Professor Mantegazza, that the wisdom tooth is frequently missing among the people of Romagna, who you describe as belonging to the Gallic race. This tooth is generally

missing as well in the French Alpine race, and notably in the population of Lozère. Till now I have only conducted my research on upper jaws; this study will be able to be pursued on the unmatched lower jawbones that are arriving to us in number from Lozère.

With regard to the study of the wisdom tooth's size and the number of its roots, this is possible to carry out even upon jaws whose teeth have fallen out; it suffices in this case to make a mold of the tooth's socket. It was in this manner that I verified the existence of a wisdom tooth possessing five roots on the famous lower jawbone discovered at Naulette in 1866.

Doctor ÉMILE MAGITOT. However much I have maintained that the lower wisdom tooth is constantly present, whether in a state of complete development or under the aspect of its embryo being more or less atrophied, in my opinion the development of this tooth is dependent on the evolution of other teeth, and in particular on the preceding molar (second molar). This opinion results, in fact, from a massive amount of embryogenic research I have conducted which I shall not venture to detail here.¹ Briefly, though, there is a follicular cordon of the second molar that detaches itself during the earliest moments of life, the prolongation of which presides over the development of the wisdom tooth. Now, the genesis of this tooth manifests itself in an unvarying manner. In the upper jaw, where no case of compression or atrophy occurs, the wisdom tooth develops normally. In the lower jaw conditions are quite different, and it is in the lack of sufficient space and in the resulting compression that one must seek the explanation for the highly frequent and serious mishaps which accompany its emergence. Furthermore, it is at this point in time with regard to this tooth's eruption that a veritable struggle takes place: where the force of development is superior the tooth effectuates its emergence with or without incident; where the resistance of the neighboring parts is too strong the follicle submits to atrophy. This latter is therefore also the most favorable outcome, because quite often it is not atrophy that occurs, but rather an unexpected organic transformation of the follicle, leading to grave consequences. But, I repeat, I do not believe in the complete disappearance of the wisdom tooth's embryo, as one can always find its trace in its normal location. All the troubles befalling the lower wisdom tooth invoked by Professor Mantegazza seem to me then, as I have stated, to be related to brachycephalism and prognathism. Here the wisdom tooth is affected by phenomena which are positively foreign to it.

As my colleagues well know, I quite often emphasize the relevancy of the dental system's anomalies as they pertain to the different races. I have also attempted in my book to consider this question in its entirety, but for now what I'll share with you is only a mere sample. As a result of my observations, it appears to me that the diverse anomalies are not less frequent in today's races than in the prehistoric and inferior races. Along these lines, an anomaly just the opposite from that which you discussed, Professor Mantegazza, a *numerical increase of the molars*, I have observed on several occasions in contemporary skulls. The *ascending volume* of the molars from the first to the third, which is an ever-present reality among the apes, can likewise be noted with a certain frequency in men today; I have collected examples of such and clearly cite them, if you please, as cases of *reversive anomalies*. The *bifidity of the root of the lower canine*, propounded not long ago as a characteristic of inferiority, is still met with in a large number of instances in our present-day races, and I have assembled many examples of such from living individuals. How can it therefore not be admitted that these same dispositions discovered in the skulls of inferior or prehistoric races simply represent an accidental anomaly?

Besides, it must be said, relevant data and findings are presently too small in number to warrant conclusions which will be necessarily premature until the day arrives when a mass of records will allow for the construction according to races of comparative statistics.

Monsieur ABEL HOVELACQUE. Professor Mantegazza, you lumped together all the inferior races. However, there exist differences between each of them. For example, I compared the teeth of the Negroes of Guinea to those of Australian aborigines; what I found is that they appreciably differ with regard to the relative size of the molars. The Naulette cavern jawbone likewise provides this thesis a striking confirmation.

Professor EUGÈNE DALLY. I do not think, Professor Mantegazza, your transformistic conclusion is in agreement with the nature of your work. The only conclusion that one might be able to confidently deduce is that the wisdom tooth is more often missing in the white races than in the black races. Doctor Broca's study of the skulls of the Lozèreans, among whom this tooth is frequently missing, demonstrates that a transformistic conclusion will in this respect prove to be quite flimsy.

Professor PAOLO MANTEGAZZA. Monsieur Darwin expressed a conjecture which has heretofore only been supported by Monsieur Owen's inaccurate assertion. My work provides it a more solid argument, and establishes its significance; this ought not to be minimized nor exaggerated.

Madame CLÉMENCE ROYER. I believe it proper to remark that the ancient skulls that you examined, Professor Mantegazza, are those of Italians, the same as the modern skulls. It would be useful to learn if the modern Italians are superior to their ancient predecessors.

It would also be important, in a parallel study, to indicate the differences between the sexes and as much as possible the social classes.

FOOTNOTE

1. See in this regard the report: Ch. Legros and E. Magitot, *Origine et formation du follicule dentaire chez les mammifères* (*Journal d'anatomie* de Ch. Robin, 1873).

Sitting an hour or longer at the corner table at Henri's cafe on Boulevard Saint-Germain for years constituted my favorite pastime, especially when it was spent in the presence of very good company (none better than yours). One of my most memorable sojourns there was on July 18th.

That afternoon I had accompanied Le Bon to the Society's meeting, an occasion that featured the master introducing for the first time the conclusions to his masterpiece, "Anatomical and Mathematical Researches Into the Laws of the Variations of Brain Capacity and their Relation to Intelligence." Le Bon's findings, some of which he had shared with me on the way, greatly excited me, and I could hardly wait to discuss them further with him. After a unique presentation on the pterion by Dimitri Anoutchine concluded the meeting, Le Bon and I stopped at Henri's.

Over a flask of Moselle and a fine meal, I listened to our friend describe how grouping one's data in the form of a series, rather than taking all the disparate numbers and simply deriving from them the average—an often meaningless value—would reveal all sorts of treasures. It was like a light being turned on in my mind, and the profundity of Le Bon's discovery became readily apparent.

With a pleasant breeze out of the northwest facilitating our desire to linger, late afternoon turned into early evening. And as we at last departed from the cafe, I believed (not yet having acquired much cynicism) that a new era had dawned on anthropology, if not science itself, with Le Bon's discovery.

“On the Conformation of the Pterion in Diverse Human Races and the Primates”

by **Dimitri Anoutchine**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of July 18, 1878

Messieurs, I have set forth the history of this question in a separate communication to the Society. Today it is my pleasure to present the results of my own research, which has been performed on a great number of skulls held in the museums of Paris (the Natural History Museum and Museum of the Anthropology Society), London (the British Museum and Museum of the Royal College of Surgeons), Berlin, Dresden, Munich, Leipzig, St. Petersburg, etc. By chiefly directing my attention to the frontward extension of the temporal bone (processus frontalis ossis temporalis), I discovered that this prolongation, which as it joins the temporal bone with the frontal bone creates a process (that is, a bony prominence), is more often met with in certain races than in others, as you will note from the following table:

<i>Europeans</i> (according to Gruber, Calori, Ranke, Kuppfer)	12 out of 1000
<i>Mongols</i> (192 skulls of Kalmuks, Buriats, Chinese, Koreans, Japanese, Mongols, and Yakuts)	15 out of 1000
<i>Peruvians</i> (886 skulls)	21 out of 1000
<i>Eskimos</i> (41 skulls)	0
<i>South Americans</i> (156 skulls)	25 out of 1000
<i>Polynesians</i> (180 skulls)	33 out of 1000
<i>Malays</i> (166 skulls)	48 out of 1000
<i>Papuans</i> (336 skulls studied by Meyer and Mantegazza)	69 out of 1000
<i>Papuans</i> (39 skulls studied by Anoutchine).	51 out of 1000
<i>New Caledonians</i> (103 skulls)	107 out of 1000
<i>Fijians</i> (24 skulls)	83 out of 1000
<i>Tasmanians</i> (27 skulls) ¹	0
<i>Australian aborigines</i> (101 skulls)	99 out of 1000
<i>Negroes of Africa</i> (367 skulls)	128 out of 1000

As you can see, in Negroes this fronto-temporal process manifests itself 10 times more often than among Europeans.² Regarding Hottentots, Bushmen, Hindus, Semitic peoples, Finns, Tartars, etc., I do not have at my disposal a sufficient number of skulls; among the Hottentots, though, this anomaly from all appearances is fairly rare. Now, the fronto-temporal process will likely not be



CHINESE TYPES



NEGROES OF AFRICA

The fronto-temporal process manifests itself very infrequently (about 1.5% of the time) in the Chinese. However, it is found in nearly 13% of African Negroes. This is over 8 times the rate in which it is found in Europeans and Chinese.

found to occur more frequently in ancient races than among their contemporary counterparts. For example, Kuppfer found 4 out of 335 modern era Prussian skulls containing a fronto-temporal process, compared to 1 out of 107 very old Prussian skulls.

In all races Wormian bones and fontanelles in the region of the pterion (which craniologists call the area where the parietal, temporal, frontal, and spheroid bones come close to one another) are encountered with much greater frequency than the union of the temporal bone with the frontal; however, among Negroes the number of skulls possessing the fronto-temporal process is a little greater than those with fontanelles and Wormian bones. Given that many anatomists (Gruber, Calori, Virchow, Broca, etc.) have expressed the opinion that the presence of a fronto-temporal process is a simian or pithecoïd quality, I believed it useful to study in this regard the greatest possible number of skulls of apes. This I did, and what my research uncovered is that the fronto-temporal process is not a constant characteristic for all the genera of primates; additionally, among the anthropoids and Pithecia (catarrhine monkeys) it is not found in the same degree for all their respective genera, as you can observe in the following table:

<i>Gorillas</i> (46 skulls, of which 14 possessed sutures in the temporal region that were sealed, so that I was only able to take into consideration 32 skulls)	1000 out of 1000
<i>Macaques</i> (63 skulls, only 58 of which were able to be examined in regard to the pterion).	806 out of 1000
<i>Chimpanzees</i> (68 skulls, of which only 54 displayed recognizable sutures of the pterion)	889 out of 1000
<i>Cynocephalids</i> (72 skulls, 68 of which were compared with respect to the pterion).	808 out of 1000
<i>Guenons</i> (38 skulls, of which 34 were able to be compared)	765 out of 1000
<i>Semnopithecids</i> (Colobis, Langurs; 73 skulls, of which only 53 could be compared).	471 out of 1000
<i>Orang-outangs</i> (74 skulls, 65 of which were able to be compared)	292 out of 1000
<i>Gibbons</i> (126 skulls, of which 24 could be compared).	125 out of 1000

So, you see that with gorillas and chimpanzees, as well as with macaques, guenons, and cynocephalids, the fronto-temporal process can be regarded as a normal characteristic, that is to say, it will be found in more than half of the cases, whereas with semnopithecids, orang-outangs, and gibbons it rather presents an anomaly, which among gibbons is not come upon more often than among Negroes. However, I must remark that there is a notable difference between human and simian skulls in this sense: in the former, as I earlier pointed out, fontanelles and Wormian bones in the region of the pterion are more frequently in evidence (up to five times as often) than the fronto-temporal process, whereas in primates these bones are an extreme rarity.

In platyrrhine primates (New World monkeys) the presence of the fronto-temporal process is a rare anomaly, and yet the conformation of the pterion in them differs very much from that of human skulls. One might express this difference by saying that in man the pterion ordinarily presents the shape of an H, while in platyrrhines it displays a figure somewhat like an H; in other words, in platyrrhines the pterion is not formed by the union of four bones (frontal, parietal, temporal, and spheroid), but of five (frontal, parietal, temporal, spheroid and jugal). The orbital part of the jugal bone is so especially developed and, on the other hand, the wing-like spheroid is so short, that the jugal joins itself with the parietal by separating the spheroid from the frontal. This conformation

characterizes the *Cebus*, *Lagothrix*, *Callitrix*, *Ateles*, *Pithecia*, *Brachyurus* genera and others; in fact, it is so characteristic that, as it has already been noted by Joseph, its presence alone will prove sufficient whenever the teeth (for example, in the young individuals) do not permit one to make an exact classification. However, among some primates, most notably in the *Mycetes* and *Eriodes* genera, the temporal bone sometimes directs an extension of itself towards the frontal bone, which in certain cases only unites with the jugal bone (thus forming a *processus jugalis ossis temporalis* which separates the parietal from the spheroid), whereas in other cases it touches also the frontal, and forms a veritable fronto-temporal process.

DISCUSSION

Doctor PAUL TOPINARD. Monsieur Anoutchine, when you found the pterion anomaly on only one side of the skull, did you record it differently than when you observed it appearing on both sides?

Monsieur DIMITRI ANOUTCHINE. In my statistical calculations I did not differentiate the cases where the anomaly was found on both sides; but I made these instances the object of a special mention in my notes.

Madame L. ROUSSELET (one of the Society's Secretaries). Pardon me, messieurs. It now being 6 o'clock, I'm afraid I have to declare this highly interesting meeting concluded. Thank you, members, for your attendance today.

FOOTNOTES

1. One finds 62 out of 1000 for the group of 529 Papuan, New Caledonian, Fijian, and Tasmanian skulls.

2. In all these cases I did not make any distinction between skulls having a fronto-temporal process on both sides and those having it on only one side.

“Experimental Researches on the Variations of the Volume of the Brain and Skull”

by Doctor Gustave Le Bon

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of July 18, 1878

Messieurs, I have the honor of delivering to you several conclusions that appear in a work on the variations of the volume of the brain and skull¹ that I shall soon be submitting to the Society.

These conclusions are based on a considerable number of measurements that I have executed upon live subjects or upon skulls belonging to the Society's Museum, and also from unpublished records whose access I owe to the graciousness of Doctor Broca. The data have been expressed in the form of line graphs which, as some of you know, have been displayed in the anthropological sciences section at the Universal Exposition.

1. The variations of the volume of the skull in the human species are greater and much more apparent than those differences that are visible when one restricts himself to a comparison of averages. Within the same race these variations are very considerable. For example, by weighing 100 Parisian skulls belonging to the male sex it will be seen that their weight will vary between 1,000 and 1,700 grams. The capacity of an equal number of skulls of the same sex will show that the volume of these skulls ranges between 1,300 and 1,900 cubic centimeters. These extreme amounts are linked to each other in a progressive manner. In mixing together all the races and both sexes, one will recognize that the capacity of the human skull may normally vary nearly 100%, that is, from a simple, small size to one almost twice as large. Many factors, of which the principal one is the level of intelligence, determine these variations or their correlates.

2. The average skull capacity of the superior races considerably surpasses that of the inferior races, but **what really constitutes the superiority of one race over another is that the superior race contains many more voluminous skulls than the inferior race.** For every 100 modern Parisian skulls examined, there are generally 11 subjects whose skull capacity falls between 1,700 and 1,900 cubic centimeters, whereas in the same number of Negroes one does not find any whose skull possesses the previously-indicated capacities. In the very inferior races, the most voluminous skulls hardly ever exceed 1,500 cubic centimeters. Comparing the largest skulls belonging to the superior races to the largest skulls of the inferior races, the difference amounts to the enormous number of 400 cubic centimeters. By contrast, the difference between the average capacity of skulls belonging to these respective races is only a little over 200 cubic centimeters.

3. The aforementioned considerable differences of the brain weight or skull volume between individuals of the same race vary substantially from one race to another. These differences become greater and greater as the race rises up the ladder of civilization, constantly increasing in the same race in proportion as it becomes civilized. By grouping the volumes of the skulls of each race in a progressive series, taking care to only establish comparisons on sufficiently numerous series in order that the extreme terms are connected in a gradual fashion, one will discover that the difference

between the volumes of the largest and smallest adult male skulls is: in the gorilla, 148 cubic centimeters; in Australian aborigines, 307 cubic centimeters; in the ancient Egyptians, 353 cubic centimeters; in 12th Century Parisians, 472 cubic centimeters; in present-day Parisians, 593 cubic centimeters. Additionally, in Germans today, this difference happens to be more than 700 cubic centimeters. The inequalities of skull capacity--hence, of intelligence--that exist in mankind therefore tend to constantly increase.

4. Height exerts an influence upon the volume of the skull and the weight of the brain, but this influence is minimal. By assembling into groups all individuals of the same height and obtaining the average weight of the brain of each group, one will discover that the average brain weight between the tallest and shortest group of individuals rarely attains a difference of 100 grams, whereas the difference in brain weight often amounts to 300 grams among individuals of the same height.

5. One's sex imparts a substantial influence upon the weight of the brain. A woman possesses a brain that is considerably less heavy than that of a man *and this inferiority subsists when both are of equal age, height and weight*. Various studies of female brains show that in the most civilized races, such as contemporary Parisians, there is a notable proportion of the female population whose skulls by their volume come nearer to those of the gorillas than to the most developed male skulls. In a general way the brain of a civilized woman much more resembles that of a man belonging to an inferior race than that of a civilized man.

6. The difference existing between the brain weight, and by consequence the skull volume, of a man and woman progressively increases as a people's level of civilization rises; so, *from the point of view of the mass of the brain and therefore of intelligence, the female tends to become more and more differentiated from the male*. The difference that exists, for example, between the average skull volume of contemporary Parisian males and females is nearly double that which exists between males and females of inferior races or of certain vanished races, like the inhabitants of ancient Egypt.

7. Female skulls of superior races, where the role of women is of little account, are remarkably smaller than female skulls belonging to a great number of inferior races. Whereas the average skull capacity of male Parisians ranks among the largest skulls known, the average skull capacity of female Parisians ranks among the smallest female skulls observed, barely exceeding the skull capacity of the women of New Caledonia.

8. With respect to subjects possessing the same skull circumference but who might present differences in skull volume upwards of 200 cubic centimeters, this is easily understood when one recalls that several factors, notably the height of the skull, may account for the variation of the volume for a given circumference. Hence, when one works on a series of skulls, one soon realizes that a 1 centimeter increase in the total circumference of the skull corresponds to an expansion of the volume that fluctuates over a 400 cubic centimeter range. The known properties of spherical bodies immediately suggest that as the circumference is increased by 1 centimeter upon a small head or upon a large head, the respective increase in the volume must be a little less or somewhat greater to that which I have just indicated.

9. The comparative study of the graphs of the skull circumference with that of the head, as

well as with the skull volume and brain weight, has made evident the relations existing between these different quantities and has rendered possible the construction of tables that, just by containing one of these known quantities, permits one to immediately determine the others whenever one operates upon a series. For example, one sees that among modern Parisians a head whose circumference is 57 centimeters corresponds to a skull whose circumference is 52 centimeters and volume is 1550 cubic centimeters. The weight of the brain contained in this skull will likely be 1350 grams.

10. There is invariably an unevenness in the development of the two halves of the brain, which is sometimes more developed on the right side, sometimes on the left, without one's level of intelligence or race seeming to have any apparent influence upon the direction of this unevenness in development. However, this uneven development does not manifest itself in the same way in each of the parts of the skull.

11. The differences in skull capacity that one observes among the diverse categories of individuals of the same race do not appear to be attributable to causes other than the level of intelligence, in view of the fact that when these categories are sufficiently well-represented, they each obviously include just as many individuals of the same height and weight. With measurements effectuated upon 1200 heads of living Parisians, I have offered proof that from the point of view of the volume of their heads they rank, from largest to smallest, in the following order: 1) *scientists and men of letters*; 2) *middle class Parisians*; 3) *nobles of ancient families*; 4) *domestics*; 5) *peasants*.

FOOTNOTE

1. *Recherches anatomiques et mathématiques sur les lois de la variation du volume et de la forme du cerveau et du crâne dans l'espèce humaine et sur leurs relations avec l'état des sentiments et de l'intelligence*. Main part: VARIATIONS OF THE VOLUME. 8 pages, out of 80 total pages containing 10 plates and 14 tables (Extract from the *Revue d'Anthropologie*).

You remember visiting in November, 1881 the Fuegians at the Jardin d'Acclimatation, a pathetic sight if there ever was one. Well, three years earlier to the month nine Lapps were on display there. Their stay in Paris afforded Doctor Bordier the opportunity to examine them and report to the Society his observations.

His talk on these people from the far north was given on November 9th, appropriately enough a very chilly day, I recall. Now, Bordier always entertained a keen interest in matters relating to the fair-haired races of Europe, as exemplified by his sweating sickness paper I sent you; so, it was natural that these blond-haired Lapps attracted his attention (come to think of it, Victor, the young assistant Bordier was so enamored with, was blond!).

Anyway, Le Bon was at the meeting, and pointed out during the Discussion that the average obtained for 150 Finnish skulls—1605 cubic centimeters—was skewed and needed revision, given that one of the skulls measured an extraordinarily large 2020 cubic centimeters. Unfortunately, no one chose to engage Le Bon on the point he was making—that the problem with averages is that they rarely are what they purport to be, and so the Discussion, as you will see, drifted off elsewhere, to a consideration of the Lapps' longevity.

“The Lapps of the Jardin d'Acclimatation”

by Doctor Arthur Bordier

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of November 7, 1878

Messieurs, after receiving a kind invitation recently from Monsieur Geoffroy Saint-Hilaire, Director of the Jardin d'Acclimatation, I indulged myself by visiting the Jardin so that I could examine the nine individuals newly arrived from Lapland.

Seven are natives of Kautokeino; they are Gaupa, his wife, his unmarried sons and niece (Sara), along with his brother and sister; the two others, Porsanger and Anti, are natives of Karasjok.

These individuals are not the same ones as those who not long ago were on display in London, and about whom our colleague Monsieur Mazard has provided interesting details to the Society.¹ Nevertheless, the Lapps shown in London came from the same place--that is, from Kautokeino. While I'm at it, I must rectify a quite substantial geographical error that our colleague has furnished the Bulletins. Kautokeino is not, as Monsieur Mazard has contended, at 90 degrees latitude nor is it situated on the Muonio River, which separates Sweden from Russia; rather, its specific location is 68 degrees latitude, 41 degrees longitude, and it adjoins the Alteelva River, which flows into the Arctic Ocean, and not into the Gulf of Bothnia, like the Muonio. Karasjok sits at 69½ degrees latitude and 43 degrees longitude. These two places are therefore in Finmark in northern Norway, and are not in Sweden.

These Lapps, which the Society's investigative commission will examine later on, are short; all have light skin and are blonds; only one is brown-haired.

What therefore is the characteristic shade of the Lapp type? What as well is the proper shade of the Finnish type?

Linnaeus, who observed them, stated that the Lapps are *corpore parvo, capillis nigris, brevibus, rectis*, and that on the contrary the Finns are *corpore toroso, capillus flavis, prolaxis, oculorum iridibus fuscis*. Van Duben, for his own part, described them as most frequently being brown-haired, although, he noted, one still sees among them blonds and redheads. Lastly, a Norwegian proverb, which has been reported to us by the interpreter, Monsieur Jacobs, says: *Dark as a Lapp*.

But Monsieur Jacobs himself has pointed out that most of the Norwegian Lapps are blonds; that the number of brunets increases among the Swedish Lapps, while in the Russian Lapps the brunets dominate.

Van Duben primarily observed Swedish Lapps; the ones that we behold at this moment in Paris are Norwegians. We should therefore be aware of the difference which necessarily arises from

these two descriptions. But, on the whole this difference, strangely enough, appears the more the Lapps are removed from Finland where the Finnish type dominates. All are, like those Van Duben wrote about, brachycephalic and orthognathous.

The head of a Lapp is typically large. For example, I am informed that Doctor Bertillon measured the capacity of five Lapp skulls belonging to the Museum of the Anthropology Society, and found them to average 1492 cubic centimeters. These skulls, it is true, as our colleague believes, are choice specimens. The cheekbones in Lapps are prominent. In a young girl the eyes are very oblique, a characteristic previously noted by Vanderkindere. In nearly all, the face, thin at its base, surmounts an extremely small lower jaw--a quality which seems to have been manifested in the Lapp skulls that were on display for several days at the anthropological sciences section of the Universal Exposition.

Doctor Bertillon, in measuring 5 skulls and 3 skull casts, found the cephalic index to average 85.6. Van Duben indicates it as being 83.5. With the only one that I have so far been able to measure, and it was taken by chance, the index was 88.63. According to Doctor Hamy, the average cephalic index of Lapp skulls belonging to the collections of Scandinavian museums is 84.93.

The skin of Lapps is light-colored, the eyes blue or reddish brown, and the facial profile appears orthognathous. Doctor Topinard ascertained a very small degree of prognathism on Lapp skulls, of 18.60 only, that is to say, an amount between that of the 16th Century French Basques (18.66) and modern Spaniards (18.46).

Finally, from however many points of view the Lapps seem to us to resemble the inhabitants of France during the Age of the Reindeer, it must be admitted that craniology does not provide us any reason to suppose that the resemblance extends to the ethnic type itself.

Based on the information that I have received up to now from Monsieur Jacobs, it turns out that the longevity of the Lapps is great. Men who exceed 80 years of age are not rare.

All the ones presently at the Jardin d'Acclimatation appear cheerful and openhearted. Additionally, it is easy to convince oneself that the classification of human races by music, proposed some time ago to the Society by Monsieur Fetis, does quite an injustice to the Lapps due to its pretense that they are the only people who do not sing, for, in fact, nearly all of them dance and sing in a bass voice.

The Lapps are nomads; indeed, they are also the only people in Europe, along with the gypsies, who are presently nomads.

Everybody knows that the absolutely essential element of their existence is the reindeer, which provides them their food and clothing, and which, being even more useful than the seal is for Eskimos, they employ as a carriage animal and as a beast of burden. These reindeer live in half-free herds, under the surveillance of dogs who call to mind those of the Eskimos, and it is with a lasso that the owner goes into the herd to select the one which he needs to harness, milk, or butcher. The indispensable nourishment for these animals is lichen (*ceromyce rangiterina*), which our Lapps at the Jardin have brought with them. The vehicle they use for transportation is a light sled shaped like

a nacelle, very different and much swifter than the kind used by Eskimos; moreover, and it is quite in keeping with their nomadic character, their baggage is even more simple than that of the Eskimos.

Their poorly-enclosed conical huts, completely open (unlikely as it may seem) at the top in order to allow smoke from the fireside to escape, are generally constructed by means of long pieces of wood brought together in bundles which are then covered with a material made out of the hair of some sort of otter. That which might be considered as the roofing is a layer of birch bark.

It is this birch bark once again which, when soaked in fish oil, serves as a torch to provide light and as fuel to warm oneself. The birch bark is also fashioned into very light sacks that are worn on the back, sacks identical to the ones our tourists in the Jardin have brought with them.

Lastly, an ingenious filter of coarse animal hair is used to strain the reindeer milk.

The mode of dress of the Lapp men and women little differ and is composed of reindeer fur and thick shoes, or boots made out of reindeer hide. The headwear of the men consists of a sort of square cap, which to the eye somewhat resembles the cap worn by Polish lancers. The women's headwear is what we would call amongst ourselves a "fool's cap," minus the small bells.

But what appears particularly interesting are the different tools that each one carries suspended from his belt: one is a spoon made out of reindeer bone and another a knife whose handle is composed of the same substance, and whose blade is iron; additionally, a series of small objects--a thimble, box of needles, tinder-box, etc., made from reindeer bone--is attached by means of a leather cord tied to a bronze buckle. This ensemble of useful items completely reminds one of the collection of similar handy tools made from steel that over the years we have developed and which are designed to be attached to one's belt by means of a chatelaine.

But two things are most striking at first sight: the first is the analogy between the present-day decorations appearing on all these objects of bone with the designs found on Bronze Age vases, and secondly the identical nature of the buckle's form, which depicts a wheel with its spokes, to buckles dating from the Bronze Age. It is therefore very likely the Scandinavian influence from the Bronze Age, and not the prehistoric art of the Age of the Reindeer, that has produced amongst the Lapps the effects which we see.

A flint strike-a-light, slung over the shoulders, completes the accouterment.

DISCUSSION

Doctor GUSTAVE LE BON. With respect to the size of the skull of the Lapps, it must be noted that 150 skulls of Finnish origin, exhibited at the Trocadero, measured an average of 1605 cubic centimeters. But one of them was 2020 cubic centimeters. This is such an enormous size that I do not believe it ought to have been counted in establishing the average, because this skull seems to me to constitute an anomaly.

It is true that at the end of the brochure describing this exhibit it is stated that all these skulls

came from the heads of criminals who had been executed. One might therefore wonder if the enormous volume of these skulls originates from the fact that they are Finns or rather because they are scoundrels. Without pretending to draw any general conclusion, I must point out that the volume of the skulls of murderers housed at the Caen Museum is very considerable.

Doctor ERNEST HAMY. You alluded, Doctor Bordier, to the research that I conducted in 1874 on Lapp skulls conserved in Scandinavian museums. By comparing my observations taken in Sweden and Norway with those from the Society's Museum, I have compiled a series of measurements that are quite numerous and which offer the unique feature of being sorted by Lapp tribes. Moreover, I have measured many skulls of Lapps belonging to the same tribe as those who are now at the Jardin d'Acclimatation, and have shared these measurements with you.

As for the similarities you noted, Doctor Bordier, that exist between the Lapps and some European types, I shall permit myself to refer to the work that I have published in collaboration with Professor de Quatrefages. In this work you will see, for example, that the series of measurements taken by Grenelle falls between ones belonging to two different Lapp tribes.

Doctor JACQUES BERTILLON, Sr. Doctor Bordier has told us that the tendency to live long is quite remarkable in Lapland. It follows from Russian records and others that, in general, the less a country is civilized, the more numerous are its centenarians, though its mortality rate will be greater. It seems that between these two elements there exists an antinomic connection.

But all these countries have this one thing in common: that, whenever it even exists, the civil state is very weakly maintained. Further, just as women have a tendency to understate their age, old men love to overstate their age; in a country where there is no well-formed civil state, this is easy to get away with. It is in this manner that the Bible also provides us accounts of cases of miraculous longevity among a little-civilized people.

Aside from this explanation, one might invoke physiology to explain the Lapps' longevity. It can be said to originate from the selection that death makes among young children in a people where the mortality rate at an early age is always very great. Those children that death spares necessarily possess an extremely vigorous constitution that is capable of triumphing over all the perils of existence.

Doctor JULES LUNIER. I agree with you, Doctor Bertillon, but with this difference: I believe less in the lack of civilization upon influencing the frequency of centenarians than that of a rigorous climate.

Doctor JACQUES BERTILLON, Sr. In Greenland, though, old age is arrived at extremely early.

FOOTNOTE

1. *Bulletins de la Société d'Anthropologie de Paris*, 1878, p. 642.

By now I had already made connections with my contact within the French Academy of Sciences, convincing him of the importance of Le Bon's "Variations of Brain Capacity" work. And so all that remained was for our friend's masterpiece to appear in print in the *Revue d'Anthropologie*, which it did in early 1879; the award from the Academy, justly deserved, soon followed.

Wishing you all my best, as ever, I remain,

Your friend,
Robert

REMINISCENCES OF A FREQUENTER
TO THE
1879 MEETINGS
OF THE
ANTHROPOLOGY SOCIETY OF PARIS

Featuring:

*Classic presentations by Doctor Gustave Le Bon, Henri Martin,
Doctor Charles Piétrement, Durand de Gros, Doctor Paul Topinard,
Doctor Arthur Bordier, Abbé Durand, Doctor Léon Ardouin,
Doctor Paul Broca and Emile Soldi*

Robert K Stevenson: Translator, Editor & Reminiscencer



Marie Antoinette before her imprisonment

86, rue de Courcelles
Paris, France

July 26, 1929

My dear friend,

I'm so glad that you found the 1878 papers most entertaining (yes, Anoutchine's pterion findings never fail to raise the eyebrows of people . . . and gibbons!) because I have uncovered for you more treasures from the depths of my piles. These should provide you additional amusement, and date from 1879, the year before our paths intersected.

I recall the Society's meeting of January 16th. That day was one of the worst of the winter; its terrible coldness was, if the members present were like me, felt all the more acutely at the meeting's termination thanks to the subject matter of Doctor Bordier's talk. His presentation—quite masterful, I must say—pertained to the Malay archipelago and its inhabitants, and over and over again our colleague reminded us about the year-round warm, if not torrid, temperatures that these islands experience. Believe me, ruminating at length about life in the tropics and then being compelled to step outside to see if one's horse has frozen stiff is the type of mental leap I prefer not to make.

Bordier had been preceded by Topinard who talked about his unusual collection of hair of Europeans. I especially direct your attention to the subsequent Discussion, which focused on the causes of graying. Several theories for this phenomenon were offered, and for once Madame Royer made the most sense, as the diminishing "collection" atop my head seems to have changed color in the manner suggested by her.

“On a Hair of Europeans Collection Exhibited in the Anthropology Gallery of the Trocadero”

by Doctor Paul Topinard

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of January 16, 1879

Before parting with the fine hair of Europeans collection that I shall soon be lending to the Exposition, I wish, messieurs, to share with you certain observations of mine which the various hair samples have inspired.

Let me begin by addressing the more or less spirally coiled aspect. The first division of hair, from this point of view, dates back to Bory de Saint-Vincent, who allowed for smooth hair and woolly hair. Woolly hair characterizes the Negro, and smooth hair the rest of mankind; but, as it is the white who is most opposite to the Negro, smooth hair came to be regarded as the characteristic of whites. Soon afterwards—and I do not know who the author was—the term synonymous with *straight* came into use. That's where science was at the time when the *Instructions* of our Society first made their appearance. Europeans were the highest expression of straight hair. The Society, only occupying itself with characteristics, took care to describe the various kinds: it presented the differences observed in hair that is straight, wavy, ripply, curly, frizzy, and woolly; the former are rectilinear, the latter form a great number of ringlets, while the others are intermediate in nature. It was such descriptions that appeared in the work of Doctor Pruner-Bey, who validated the results obtained earlier by Weber in Germany and Brown at Philadelphia. It was proven that in the yellow races and their derivatives hair is cylindrical, stiff, hard, and similar to the coarse hair comprising the tail of a horse; on the other hand, it is flattened in all the woolly-haired races; and finally, it exhibits an intermediate shape in the European races, Australian aborigines, etc.

Straight hair is therefore the first category of hair, and no other; in the yellow races only is it characteristic of the rectilinear course that the hair takes. The second category meriting a designation is *wavy*, which characterizes the hair of the European race, while *frizzy* describes the hair of dark races that do not have woolly hair. After the appearance of Doctor Pruner-Bey's findings, notwithstanding the earlier stipulated usages, the designation *straight* was retired as a descriptive term for the hair of Europeans.

The hair samples that I shall show you are proof that I am on solid ground for promoting the preceding categorization. In anthropology, which concerns itself with the living or with skulls, one does not consider when investigating qualities, and with good reason, but the average. With the European this average with respect to hair is unquestionably the wavy state. However, the fluctuations around this average are considerable, for a certain number of European hair samples are straight in the same sense that the designation *straight* means, while others are curly or frizzy (otherwise said to be very coiled up in spirals).

All these intermediate forms can be observed in the six or seven hair samples that I have brought today to show you. Here are some, messieurs, that are even more than frizzy; if you closely examine several of these hairs that have been pulled apart, most assuredly you will see that they do not evidence five or six spiral turns, but rather from ten to twenty. Indeed, some of these spirals make a complete turn that barely measures 7 or 8 millimeters in length. Now, we often speak of the hair of the Negro in terms of how much it can be stretched. In fact, you are well aware that the diameter of ringlets of woolly hair varies with the degree of *Negroidism*, if I may so express myself. Bushmen, for example, have ringlets which measure 2 to 4 millimeters in diameter; Kaffirs and the Guinean Negroes have ringlets measuring 4 to 8 millimeters, while mulattoes have ringlets 1 or more centimeters in length. I mention all this in order to make the following point: these exclusively European hair samples I've brought today show how difficult it is for one to trace with the naked eye the exact line of demarcation between woolly hair and the state that precedes frizzy hair, and it therefore should be apparent that, in order to accurately categorize certain hair samples of Europeans, one must search for a word that does not exist, because one cannot see to employ the designation *woolly* in this instance. Before quitting this subject, I want to point out to you that in the varieties of hair that you now behold, the hair at times differs along its length; sometimes it is simply wavy in one part of its extent and then becomes frizzy, or vice versa. Can the microscope provide an explanation for these alternations and differences? I myself do not yet know the answer.

The next area of investigation upon which I wish to draw your attention deals with modifications of hair color due to the milieu. Here, messieurs, is hair that is brown on the half that adhered to the scalp, but reddish blond on its free half; this latter part was exposed to the air and sun. Now, we do not know how far this alteration is able to proceed, and one is right to wonder if, given a climate other than the north and that the person keeps his head hardly ever covered, the hair might not completely change its color. Of course, any hypothesis that one makes for an individual would also apply to all others of his race. Here I am now holding up two locks of hair, both white from old age. But, this first one belonged to a high society lady who had taken care of her head; as you can see, the hair is silver-white in color. This other lock belonged to a peasant who worked outdoors; it is yellow. This alteration of the hair by the milieu is a common thing and is well known by those engaged in today's prosperous hairdressing business.

Having just mentioned the hairdressing business reminds me to encourage you to visit, if possible, my collection of Chinese hair samples currently on display at the Exposition; they present the complete gamut from jet-black to flaxen blond and fire red. More or less repeated applications of hydrogen peroxide lotions were the cause. Interest in this fact comes from the relatively frequent descriptions provided by explorers of brown, blond, and above all red hair in races whose hair is known to be naturally black—for example, among the Australian aborigines, Papuans, and Negroes of Africa. There are other causes that are capable of explaining these abnormal colorations, such as complete or incomplete albinism; however, the use by savage tribes of lotions and pomades that discolor (intentionally or unintentionally) a tribesman's hair must never be lost sight of whenever you find yourself in the presence of these contradictory cases.

The final point I wish to bring up pertains to the fading of hair that occurs in old age. It is generally acknowledged that a single hair fades by degrees from the tip to its root. At other times, it appears, the fading takes place in blocks which ultimately become confluent. Here is a third way: the hair initially emerges from the scalp dark-colored, but little by little it grows gray and finally white. The decoloration occurs in some subtle way in spite of the continued production of hair, as the tip of the hair preserves its integrity. In fact, on this long hair I'm now holding 30 to 35 centimeters of its free part is quite black, 30 to 35 centimeters of its adherent part is white, and a small intermediate zone is turning gray. Professor Bert, incidentally, has declared that this is the first evidence of this kind of decoloration pattern that he has ever encountered.

DISCUSSION

Professor ANDRÉ SANSON. Every time that I have meant to talk about *woolly* hair, I have combatted this improper expression. This is because there are all kinds of woolliness; there is that which has the appearance of very stiff hair, while there are other kinds that resemble extremely encoiled hair. Properly speaking, it is therefore meaningless to characterize hair by the designation *woolly*, as all hair without exception can be compared on a woolliness basis.

You have just shown us, Doctor Topinard, a large lock of hair that is white at its base, and you mentioned that this fact had very much surprised Professor Bert. This is, however, the way such fadings normally happen. Whitening at the tip is itself in opposition with the mode of production of hair, and can only be understood by the action of outside influences. The luster of hair, which in part gives hair its color, is in reality due to the scalp-produced oil which is naturally glossy; one realizes that exposure to the air, rain, etc. can make this oil disappear, and modify in that way the color of the hair. The resulting decoloration will mainly occur at the end of the hair, but will just be slight, and cannot be compared to the old age whitening process that manifests itself only at the hair's base. Each hair generally grows colored, and its end remains such. At a given moment, though, it grows white, with its base then becoming white; however, one cannot understand how this single event will be sufficient to account for all the hair losing its color. The facts that some have cited against this point of view are very dubious. Thus, some have claimed that the hair of Marie Antoinette had turned white in one night; but, her correspondence with the Princess of Lamballe informs us that for a long time already her hair had been graying on the temples, something she had worked hard to carefully conceal while she was happy. When the various misfortunes overcame her, she neglected this coquettish precaution, and it was at that point that her hair gave the appearance to have all at once whitened.

Doctor ARTHUR BORDIER. One can, indeed, show oneself to be skeptical of the kind of superficial facts that you just noted, Professor Sanson. But some others—different, moreover, from the preceding on several points—have been observed scientifically. For example, I shall cite one observation of this genre that I made with Professor Gubler which



Marie Antoinette before her imprisonment

concerned a married lady who was subject to quite violent and very long migraines; each attack on her lasted two or three days, and during this time her hair would grow white. Once the migraine passed away, her hair recommenced to grow brown, this constituting its normal color. The result was that her hair showed along its length alternating short white and brown parts, so that one could count on each strand the number of migraines this lady had experienced.

Doctor PAUL TOPINARD. I acknowledge, Professor Sanson, that the expression *woolly hair* is improper; but, the expression is allowed, and there are no sufficient grounds to try to change it. In science there exist other defective designations that we nevertheless maintain.

Doctor PAUL BROCA. With respect to the way in which hair whitens, I am reminded of the following case that Blandin published. An elderly white-haired woman possessed a large cyst on the top part of her head; inside this cyst, which had been ever present during the woman's life, a quantity of very long hair was found, of which several strands were up to 1 meter in length. Near their free end they were fine and blond; in their middle part they were thicker and brown (this was the color of the woman's hair during her youthful days); finally, at their base they were white.

Madame CLÉMENCE ROYER. Messieurs, you have enumerated all the cases except the one which is the most frequent: that is to say, where most of the hair retains its natural color, with some hair at first, then a greater and greater number with age, becoming totally white from one end to the other, this occurring rapidly sometimes in a few days. This process is what brings about gray hair which is so common and which occasionally subsists up to the most advanced age. Any hair that whitens otherwise presents an exceptional case.

Professor EUGÈNE DALLY. Many explorers have reported the existence of races of men inhabiting, among other regions, Colombia that possess hair which never whitens. This report has been cited most notably by our colleague, Doctor Jourdanet. I wish to know if this finding is well proven and if it has been met with in other peoples.

Doctor PAUL TOPINARD. There are, indeed, other peoples, Professor Dally, of whom the same can be said, such as the Yuracares of South America, who live in forests that are nearly impenetrable to the rays of the sun, and where albinism is very frequent.

“Medical Geography Instructions for the Malay Archipelago”

by **Doctor Arthur Bordier**

(Professor of Medical Geography at the School of Anthropology)

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of January 16, 1879

Doctor Rück, presently a physician in Sumatra, has honored the Anthropology Society by requesting it to guide his studies on the Malay archipelago, specifically from the medical point of view.

Charged with responding to his request to the Society, I am not afraid to state that the situation of Doctor Rück enables us to await from him more than he will receive from us.

I shall nevertheless, by means of an outline that can be of service to the original researches of our confrere, provide a summary of the current state of our knowledge on this question.

The Malay archipelago, commonly called *Malaysia*, is comprised of the islands of Sumatra, Java, Borneo, Timor, the Moluccas, the Celebes, and the Philippines; these islands extend from 10° S. latitude to 19° N. latitude and 90° E. longitude to 128° E. longitude.

One therefore ought to expect to find in Malaysia the principal marks of the *intertropical pathology*: *heat* and *humidity*, each contributing to assure the sudden appearance of various maladies. It is important, however, to make allowance for three conditions:

1. The insular topography;
2. Variations in altitude;
3. The seasons.

Insular topography. — Thanks to the topography of the constituent parts of Malaysia, the average temperature, although hot, does not exceed 30° C., whereas much farther from the equator in continental India it rises up to 40° C.

Variations in *altitude*. — One needs to know not to mix within the same medical geography study the different parts of the Malay territory without taking into account differences in altitude.

Accordingly, and rightly so, Dutch researchers have divided Malaysia into many zones with respect to altitude:

A *torrid* zone, comprising land between sea level and an altitude of 2,000 feet,

presents in its lower part a temperature of 27° C. and in its upper part a temperature of 23° C.; the quantity of water vapor is 20.25 grams per cubic meter.

A *temperate* zone, from 2,000 to 4,500 feet, possesses an average temperature of 23° C. at its base and 18° C. at its top; its humidity level is 15.7 grams water vapor per cubic meter.

A *cool* zone, ranging from 4,500 to 7,500 feet, and averaging 13° C. at its highest part, has a humidity level of 11 grams water vapor per cubic meter.

A *cold* zone, existing from 7,500 feet to 10,000 feet, is characterized by both a low average temperature of 8° C. and a low humidity level of .76 grams of water vapor per cubic meter.

Lastly, the *seasons* supply an important element of variability to the intertropical pathology. When the sun is in the southern hemisphere, the wind blows from the northwest, bringing about the *wet monsoon* (or *bad monsoon*). When the sun is in the northern hemisphere, the wind blows from the east, producing the *dry monsoon* (or *good monsoon*).

It is nonetheless true that the *torrid* zone is the most extensive and that the hygrometer reads .80 to .81 in the dry season, and .91 to .92 in the rainy season.

Heat and humidity make Malaysia a land of *fever*, *hepatitis*, and *dysentery*. Many writers, Armond among others, think that people have very much exaggerated the insalubrity of Sumatra and Java. In Sumatra notably, if the west coast is extremely unhealthy and has justly been named the *coast of pestilence*, the east coast will frequently present examples of great longevity.

Nevertheless, torrential rains, frequently overflowing streams, luxuriant vegetation that furnishes an abundance of detritus, and lastly constant warm weather—all these contribute to supporting homes for and sources of malaria.

But these malarious homes only become homes of intermittent fever for man. Enormous pachyderms seem to find in these insalubrious surroundings particularly favorable conditions of development. Man does not have this privilege, or at least, if he has it, he has it more unequally; in other words, if the study of the climate of Malaysia must precede any methodical study of the pathology of this region, one can say as much for the study of another milieu, the human milieu, or the *study of races*.

Doctor Rück, in the studies that he intends to make, ought therefore to not just strive to construct a geographical map of maladies that allows for climatic or seasonal variations, which would also be very useful to the science of colonization and acclimatization; but, above all, he could render a great service to *anthropology* by sending us what can be called *ethnologic* maps of pathology.

What is the pathology of Malaysia, and what is, throughout the Malay archipelago, the pathology of each race?

Well, the races are numerous. One finds here a veritable jumble of races that are today difficult for one to make a distinction between, given that they are mixtures, confoundedly so up to a certain point.

The black, yellow and white races of varying purity that are met with in Malaysia are more or less complex melanges of the following: *Negritos*, *Papuans*, *Dravidians* and *Mundas*, *Allophyles* and *Aryans*, *Indo-Chinese*, *Malayo-Polynesians*, and *Malays*, all of whom have come into collision with the *European*, *Arab*, and *Chinese*.

Black race. — The black race, perhaps the most ancient of Malaysia, has been in all respects displaced, and has largely disappeared by either amalgamation or extinction.

This race, which is quite different from the black African race, is derived most likely from the Southern Mundas, and belongs to what we call the *Negritos*. It only exists in the interior of the Philippines, where it is represented by the *Aetas*; in the interior of Halmahera; and perhaps, it is said (but this fact needs to be verified), in the interior of Borneo and Sumatra.

The hair of *Negritos* is woolly, but the forehead is more bare than it is among the Negroes of Africa. The nose, though flattened, is turned up at its tip; the lower jaw is narrow.

According to Bernardo de la Fuente, one needs to distinguish between two black races in Malaysia, and especially in the Philippines. One race will be short, woolly-haired, and little civilized; these people are the *Aetas*—*Negritos*. The other race will be taller, with smooth hair, and is named the *Endamens*; these people turn out to be cross-breeds of the yellow race and *Negritos*. Unfortunately, the word *Endamen* lacks precision, it having been used by Lesson to name blacks with smooth hair inhabiting New Guinea; but there do not exist in New Guinea any blacks with smooth hair.

Relying upon various pieces of information, Professor de Quatrefages and Doctor Hamy have proceeded to point out that the *Vandamenes* are a Papuan tribe in New Guinea, and that they are very distinct from the *Negritos*.

Does the Papuan area, which is near that of the *Negritos*, extend beyond just one part of Malaysia? This remains to be determined. I can ask as much about the *Alfurus* of the Celebes who, although this name has been given to different tribes, are only, in reality, Papuan tribes from western New Guinea whose extent includes the Celebes and the Moluccas. To the *Negritos* one must also attach the Orang Sakai of Belitung and Bangka, the Dagangs of Borneo and the Daras of Sumatra.

The *yellow race* is represented in the Philippines by the Igorots; additionally, in the Philippines the rather vaguely named *Indo-Chinese* race—more commonly known as the *Tagals*—has driven the *Aetas* back into the country's center.

To the *Malayo-Polynesian* race belong the other groups inhabiting the Malay archipelago. These are:

The *Bataks* of Sumatra, who are dolichocephalic and who possess a thinner nose and less prominent cheekbones than the Malays; the men have thick beards, while the breasts of the women are voluminous and globulous. A close correspondence has been signalized between their type and the purest Polynesian type.

Living in the forests as nomads, they engage in a rather peculiar commerce at Palembang: one deposits at a convenient drop-off spot certain commodities (rice, fabrics, and so on), sounds the gong and withdraws from the place; the Bataks then arrive, carry away the objects and leave behind at the drop-off ivory, after which they retire back into the forest.

Also inhabiting Sumatra and belonging to the Malayo-Polynesian race are the *Passumahs*, who are a mixture of Bataks and Javanese.

Looking at Borneo, we see that the *Dayaks* play the same role there as the Bataks do in Sumatra. These celebrated head-hunters maintain with great care vases of enameled pottery, which they say had been brought from India a long time ago.

In the Celebes the *Buginese* belong to the same race; however, according to Rochas, they are much superior to the Bataks and Dayaks, and are distinguished for being a completely energetic, sportive people. Very fit for civilization, it is the Buginese who perhaps one day will be capable of struggling unaided against the Malay tyranny.

The *Rottinese* seem to form a type apart from others inhabiting the archipelago. Their flat, slender nose, not very prominent cheekbones, thin lips, and flowing, if not often curly, hair go with a very dark color of the skin.

The *Malay element* dominates in all the previously-mentioned groups, I should add.

Now, it is only with great difficulty that one sees how to disentangle the Malay element in an investigation of the chronology of races; moreover, this element above all appears to be the result of a complex melange rather than as one of the primordial composing elements. Variable on such and such a point according as to how the melange has been effectuated in differing proportions with other races, the Malay unity only definitively rests on the union of the yellow race and black race, as well as on the community of fanaticism that Islam has given to these people—people who Professor de Quatrefages has justly named the *Arabs of the Orient*.

It was about 1160 A.D. that these people appeared for the first time in history; shortly afterwards, proceeding westwards from Palembang in Sumatra, they went on to establish Singapore in the Malay Peninsula. But, this east to west movement had itself

been preceded by a contrary movement of people who, emanating from the valley of the Irrawaddy in Burma, had dispersed themselves through the Malay Peninsula into the Sunda Islands, and who in the process had come into collision with those islands' three races—the Negritos, Papuans, and Polynesians.

One finds them nowadays a little everywhere throughout the archipelago, but mainly in the southwest part of Sumatra, Borneo, Bangka and Riouw.

The physical qualities of the Malays are as follows: the height is not very tall, the skin is light brown and copper-colored, the nose is short, flat, and broad, with the nostrils being dilated; the jaw is prominent as are the cheekbones, and the face is as wide as it is long; the mouth is large, the lips thick, the beard thin, and the hair is black, straight, thick, hard, and rarely curly.

On the whole their type approximates that of the Chinese; the Malays are Mohammedans, fond chewers of the betel leaf, intelligent but tyrannical, lazy and perfidious, buccaneers and pirates, and above all cosmopolitans.

Besides these well-established types one meets with in Malaysia, additional types, living in a more or less isolated state, are encountered. These include:

The Hindu type, which persists near the famous ruins of Borobudur in Java; in the Tengah mountains one still beholds a tribe called the *pagans of the Tengah mountains*, which is directly descended from the Hindus. Kindly, open-hearted, and hospitable, they have nothing to do with opium or strong liquor.

A population named the *Telingas* from the coast of Malabar in southwest India make their way to the Sunda Islands with the west monsoon and go back with the east monsoon.

The *Arabs* have been in Malaysia since the third century. They have interbred less with the other races than have the Chinese.

The *Chinese* have been dispersed throughout the Malay archipelago since the fifth century, but it has only been since the sixteenth century that they have established durable colonies on the west coast of Borneo. Working mainly in the mines, they have formed societies—sort of small federative republics—for the exploitation of the mines, and have pushed out of their way the Dayaks, just as the Malays have done.

Finally, one finds in Malaysia the European element, brought over from Europe in great numbers by the Dutch and French overseers after the revocation of the Edict of Nantes, and their very beautiful (it is said) hybrid offspring, who are known under the name of *Lip-Lap*.

It is therefore over this quite varied terrain that Doctor Rück will have to conduct his research.

Before studying the pathology that the various climates and races of Malaysia will present to him, it would prove interesting for our physicians and useful for ethnology if Doctor Rück would acquire some more precise information than what we already possess concerning the *medical practices* of the Malays and of the peoples under their submission; and by *medical practices* one may include, by extension, not only the popular usages and customs whose unconscious aim, if not result, is hygiene—such as, for example, the chewing of betel leaves—but also practices possessing a much more *conscious* aim, notably those having as their object the poisoning of arrows and daggers.

The exercise of medicine on the part of the Malays is characterized by a certain emphasis; they nearly extend into a science the art of *massage*, *compression*, and *frictions*. It is mainly old women who practice these maneuvers to which they give the name *pitjit*. A typical *pitjit* session often runs for two hours or more nonstop, and our Navy doctors have themselves verified excellent results from the use of *pitjit* in the treatment of rheumatism, which is very rare in the Sunda Islands.

When it comes to means of effecting childbirth, by contrast, one sees the Malays engaging in many less sagacious practices: as soon as the bag of waters ruptures, the pregnant woman is laid down on the floor, and from this moment on the midwife never lets go of the cervix of the uterus, pulling out that which presents itself, this occurring while vigorous female assistants push down on the patient's stomach in order to force the baby to emerge. If these means of force continue to be ineffectual, the midwife and her assistants attempt a kind of exorcism; they order the baby to emerge at the same time that they spit upon the face of the mother. As soon as the child is delivered, and the assistants have gotten rid of as much of the placenta as possible, the mother takes a bath and attends to her affairs.

As for the baby, after having cut the umbilical cord once the afterbirth has come out, the helpers celebrate the newborn by snacking on fingersful of rice mash.

Nothing gives better proof of the robust constitution of the Malays than these practices to which they apply themselves.

I must, of course, mention the well known custom of chewing betel leaves—an essentially Malay practice—which seems to contribute a great deal to tonifying the digestive canal (which is so subject to diarrhea in the hot countries); above all, this custom prevents and impedes, like a parasiticide, the development of numerous maladies caused by parasites. I should add, as most of you know, that Du Perron himself has quite happily conformed to this custom.

Many plants are employed with advantage as medicines by the Malays. These include:

The milk of *cocos nucifera* in genito-urinary ailments;

The leaves of *hura crepitans* against framboesia.

Ophioxylon serpentinum is employed as a counterpoison for venomous wounds; lastly, *radix toxicaria* is a potent emetic, commonly used by the natives to combat poisonings or poisonous wounds.

Doctor Rück will certainly be rightly inspired to study the effects of these substances and to send us samples that would be able to be submitted to analysis as well as augment our therapeutic arsenal.

Deadly methods have not been any less developed and refined in Malaysia than the curative agents. It is thus that we see in Java the natives applying on their arrows the cutaneous secretion of a lizard, the *gecko virosus*.

In Borneo the natives also avail themselves in a like manner of the juice of the *antiavis toxicaria* and *strychnos pieute* plants, as well as of that of two other plants—the *nerium* and *fabernea montana*; finally, they utilize in the same sense a cantharis, the *lytta ruficeps*.

All these poison-tipped arrows do not seem to have been very murderous in the last war against the Dutch; nonetheless, it is true that during battle the weapon was one after another withdrawn from the wound and that suction was then carefully carried out.

Doctor Rück will therefore again merit praise and our thanks by sending us and studying on the spot the diverse substances in question.

Turning to another area of investigation, we lack data on the average life expectancy of the different races of the Malay archipelago.

It appears, meanwhile, that in the Philippines the Spaniards do not reproduce themselves much beyond the first and second generation without intermixing with the indigenes. For example, in 1875 one census taken in the Philippines of those between 25 and 100 years of age came up with 4 Spaniards, 226 hybrids, 5,746 Tagals, and 2 Chinese; those over 100 years old numbered 4 hybrids and 283 Tagals.

At Batavia (Java) the death rate of foreigners is 1 out of 16.53, and that of the indigenes is 1 out of 24.80.

The Malays are renowned for their uniquely special ability to go without water for a long time. It would perhaps be interesting, through analyses of the blood and above all by determining the number of blood cells, to research the cause of this phenomenon.

Before studying the different maladies that severely affect with more or less frequency each race inhabiting the Malay archipelago, a comparison of the *intensity* and *form* of the illnesses common to all the races would prove of interest. I say this in light of the observations of Doctor Van Leent, who found that the maladies assumed amongst the Europeans an *inflammatory* character, and amongst the natives an *erethitic* character.

The three main illnesses of Malaysia are *intermittent* fever, *hepatitis*, and *dysentery*.

In Java the natives suffer less from intermittent fever than do others; however, according to Doctor Van Leent, those who come to Batavia from the interior of the island, or those who inhabit the old town which is located along the river, are sometimes gravely attacked.

Furthermore, whereas the pernicious form of intermittent fever is with the European *algid* and *apoplectic*, with the *indigene* it is *comatose*, an important distinction to take into account when examining the difference of races placed in the same milieu.

From 1855 to 1857 the Dutch ships at Java reported the following 4,089 cases of intermittent fever:

Quartan fever.	46
Tertian fever.	990
Quotidian fever.	2889
Irregular fever.	<u>164</u>
	4089

Also, as you might surmise, intermittent fever does not reign with the same intensity throughout the Malay archipelago; although it strikes very frequently on the west coast of Sumatra and at Batavia, it is entirely nonexistent in Makassar and on the west coast of the Celebes.

Dysentery is extremely frequent in Java; at Surabaya it causes one third of all cases of disease. In Sumatra and the Philippines dysentery is likewise very common and serious; it strikes without distinction of race, sex or age, and the number of indigenes taken care of in the hospitals is considerable. Nevertheless, indigenes and the acclimated are less subject to this malady.

Doctor Pop has provided the following ratio of Europeans in Malaysia attacked by dysentery: in 1860, 7.17 Europeans out of 100 were affected; in 1861, 6.72; in 1862, 6.72; in 1863, 6.02; in 1864, 2.75; and in 1865, 3.28. This progressive diminution to all appearances corresponds with the improvements in hygiene introduced everyday by the Dutch.

Hepatitis also occurs with great frequency, but it mainly attacks the Europeans. Its extent throughout Malaysia matches that of intermittent fever because, like this latter, hepatitis is rare in the Celebes and the Moluccas, though common in the coastal region of Sumatra, Java and Borneo (where intermittent fever is always prevalent).

Cholera has a permanent presence throughout the entire archipelago; it strikes the natives as much as the Europeans. Bontier is said to have observed it in 1631; cholera seems, however, not to have been introduced into Malaysia until 1819. It was, at least, only after this date that it became endemic. It appears to have disappeared from 1830

to 1853; but, in 1864-1865 it inflicted frightful ravages in Java.

One malady that ought to especially attract the attention of Doctor Rück is the strange ailment called *beriberi* which so little is still known about. Our correspondent will be in a position to choose among the numerous theories that have been emitted on the disputed *nature* of beriberi, having considered it in turn as:

1. A myelitis epidemic (Vinson);
2. Rheumatic-related;
3. A kind of scurvy (Dutch doctors);
4. A *miasmatic* poisoning (English theory);
5. A blend of scurvy and malaria;
6. A blend of scurvy and rheumatism.

What is certain is that this malady scarcely effects anyone but the *indigenes*, yet it deals less severely with them than it did in former times, owing perhaps to *native convicts working in the rivers, cleaning up the water*. Beriberi claims its victims mainly in Sumatra, Java, Amboina, and the Moluccas.

Identical affections have been depicted under the name of Amboina button and framboesia. Bontier was the first to identify Amboina button as a venereal disease and more particularly to associate it with a variety of syphilitic *molluscum*. It seriously afflicts only the blacks and Malays, especially women as well as children 10 to 12 years of age. It is contagious, inoculable, and hereditary. Most interestingly, it does not attack the *indigenes*, but does the half-breeds, evidence of the import of pathological qualities.

One very important fact to check is the result of framboesia inoculation against *leprosy*.

Lastly, truly *ordinary syphilis* is not rare; but, in certain islands west of the Celebes, and notably at Gorontalo, it is not of a very ancient date. It arose in 1854.

DISCUSSION

Professor EUGÈNE DALLY. From what explorers have said, the population density of Java surpasses that of the most populous countries of Europe. One will not count fewer than 17 to 18 million inhabitants in this island. What has brought about such a high density? Clearly, it is important that light be cast upon this demographic problem.

Now, the diet of the inhabitants might up to a certain point be able to explain this exceptional density. Indeed, it is an established fact that the Javanese feed themselves hardly anything; their nourishment is exclusively vegetable, and it is not very ample at that. But, this presents another problem. How can people who are so little nourished be equal to the strenuous agricultural work to which they apply themselves for the most part?

Additionally, these people also appear to be able to endure hardships that to us seem very considerable. For example, in Java one observes divers named *cliqs* who are capable of remaining under water for four or five minutes; one might compare them to the Japanese running footmen who run all day and only pause long enough in order to take in some nourishment. One must wonder if it is some sort of special training which permits them to carry out these grueling tasks, or if it is a particular physiological disposition.

Among the maladies that one finds among the Javanese, elephantiasis merits special mention; we know that in the West Indies this illness indiscriminately strikes all races, including the whites.

Doctor Bordier, you indicated the frequency of madness among these people. Now, different species of madness strikes them, and one in particular ought to be cited—the murder madness, called *amuck*. The individual struck with this madness is immediately declared sick and irresponsible. Everyone rushes him in order to prevent him from committing some murder, and they overpower him at once. I wonder whether the use of opium is sufficient enough to account for this singular malady.

Doctor JEAN PIERRE BONNAFONT. One must understand that they use opium together with hashish. This fact is important because if opium rarely brings about sanguinary excitation, one ought not to say as much of hashish.

Doctor JULES LUNIER. Among the forms of madness that have been described to us, *amuck* is one which appears closely analogous to inebriation. It would be interesting to obtain information on this subject: to what degree are alcoholic drinks consumed on Java? etc.

Epilepsy is also fairly common in the Dutch East Indies; I believe it is worth investigating whether the murder madness of which you spoke, Professor Dally, has any connection with epilepsy.

As for Malaysia's high population density which so astonishes you, Professor Dally, this can be largely explained by the fact that we are dealing with islands. All things being equal, one readily observes that the world's coastlines are more heavily peopled than the interior lands.

Madame CLÉMENCE ROYER. The law that you have just posed, Doctor Lunier, about the constant affinity of a country's population to coastal areas is far from being a general law. For example, in Europe, Belgium, which has a dense population, has only a very short coastline, much less extended relative to that of Greece or Italy.

In short, no part of a country's population is attributable to the length of the coastline; however, population density does have a direct correspondence with the commercial or industrial activity level of the people. This latter law therefore should answer your question, Professor Dally—that is, given that industrial and commercial activity allows for the

importation and exportation of goods, a very commercially-active country can be much more thickly settled than if it were unable to realize revenues from its indigenous agriculture.

Doctor ARTHUR BORDIER. I must point out that although the population is very dense in Java, it is, on the other hand, quite sparse in Sumatra.

In the full report that I am sending Doctor Rück, I mention the murder delirium which you highlighted to us, Professor Dally. I believe that when the causes of this malady are researched, the true causes will be found to reside less in the drinks or excitants peculiar to the Malays than in the nature of these people themselves. The degree of intoxication differs more depending on the individual than with the poison employed for producing the effect. Indeed, in whatever case of drunkenness that is exhibited, the character of the man, not being governed by reason, appears in its nakedness; this is why we justly say: *In vino veritas*. The Malay, whose character is fundamentally violent and wicked, lets become visible, when he is drunk, all that which his temperament contains of fiery sentiments. No other excitant renders him any better.

One must not confound the betel leaf with the intoxicating substances that people use in these islands. In fact, the betel leaf is a first-rate parasiticide. If diarrhea strikes the European in Cochin China while it spares the indigenes, it is because the European does not make use of betel, which attacks germs in proportion as they have been absorbed.

Professor EUGÈNE DALLY. On this subject, I recall that when our troops first arrived in Cochin China, they instituted the practice of drinking only tea or boiled water. Our troops initially adhered to this local custom which has, as one can see, its reason for existing; after a while they abandoned this practice, whereupon the diarrhea of Cochin China commenced its ravages. In vain Doctor Dounon demonstrated the parasitic nature of this malady; in vain he insisted that our soldiers reinstitute the practice of exclusively using boiled water. This measure, so easy to follow, has not been adopted, in spite of all the factual evidence.

Doctor JULES LUNIER. I believe, Doctor Bordier, that you are far from the truth when you say that the degree of intoxication varies with the races rather than with the agents that have provoked this cerebral state. Respecting this point, I have data that has been collected in America, and in reviewing it one will notice that intoxication affects the Negro and the white in an identical manner.

Doctor ARTHUR BORDIER. It is nevertheless admitted, Doctor Lunier, that the Negro can tolerate enormous quantities of alcohol without becoming drunk. In addition, his intoxication itself is different from that of the white; when in the drunken state, he is, so to speak, less ideal than the intoxicated European, but is more practical. Thus, there is, in fact, both a difference of dose and action.

It was some time during the next three months that I made the acquaintance of the composer Vincent d'Indy, who earlier in the '70s had occupied the same shoes, so to speak, that you and I had worn as young anthropologists. D'Indy related to me that many years before in 1872, when he was but 21 years old, he managed to have himself introduced to the incomparable César Franck. For the occasion, which took place at Franck's residence, d'Indy brought with him a Piano Quintet that he had recently completed, and proudly played it for the great master. Upon the piece's conclusion, Franck sat in silence for a while, and finally commented sorrowfully: "There are some good things; the ideas would not be bad, but—you don't know anything at all!" D'Indy, totally stunned (as he had expected to receive high praise), quickly gathered his things and left the room, convinced that the master was completely out of touch with reality; by the next day, though, having slept over the matter, youthful anger and wounded pride had given way to rational reflection, and the rookie composer could only admit to himself that Franck had been absolutely correct. He soon became one of Franck's star pupils, developing into the excellent musical artist that he was by the time he and I met.

But, the story does not end there. D'Indy allowed me to accompany him on many occasions to Franck's home, where the master religiously spent 2 hours each morning working on his compositions. Franck at the time was himself composing a Piano Quintet (in F Minor), and throughout the year I had the privilege to witness the creation and evolution of this highly remarkable work. Before attempting to describe this piece to you, I must first remark on the man himself, as you were never fortunate enough to meet him. What stands

out in my mind most of all about Franck is not his outstanding abilities as a composer, but rather his supremely calm nature and goodness as a person, traits whose opposites, as you'll now see, were the subject of much consideration at the Society's meeting of April 17.

“The Skulls of Murderers”

by Doctor Arthur Bordier

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of April 17, 1879

Messieurs, displayed in the Caen Museum's showcase during the recent Anthropology Exposition were thirty-five skulls of murderers who were guillotined for their crimes. In addition, one other skull, that of the celebrated Lacenaire, was exhibited by the Orfila Museum. In examining these skulls, I discovered numerous traces of pathological lesions highly deserving of attention; these form the subject of the second part of my talk today. Now, before making this interesting discovery, I conducted an anthropological study of these skulls utilizing processes that I have ordinarily applied to skulls emanating from various parts of the globe. Here are the results of this study.

ANTHROPOLOGICAL CHARACTERISTICS

Skull volume. — The skull of murderers is quite voluminous: using Broca's cubature process, I found their average to be 1,548 cubic centimeters even after I had eliminated the maximum-sized skull whose volume, evidently pathological, measured 2,076 cubic centimeters (cc).

The following table, messieurs, shows the result of my measurements respecting skull volume:

Out of 100 skulls belonging to each category, the percentage corresponding to each measure.

	West Cemetery	Murderers
1300 to 1400 cc	21.87%	11.42%
1400 to 1500 cc	18.75%	14.28%
1500 to 1600 cc	43.75%	28.57%
1600 to 1700 cc	3.12%	22.85%
1700 to 1800 cc	6.25%	16.66%
1800 to 1900 cc	3.12%	2.77%
1900 to 2000 cc	3.12%	0.00%
2000 to 2100 cc	0.00%	2.77%

You can see that the skull volume of the murderers is generally more than that of the individuals interred in the West Cemetery.

Ought one therefore to conclude that murderers are often more intelligent than honest people? This, indeed, would be a sufficiently distressing conclusion. Fortunately, a more detailed study reveals that this is not the case. In addition to the data obtained from

studying the curvature of the skull, what results from an examination of the pieces is that it is, undoubtedly, a pathological action, such as cerebral sclerosis (development of cerebral cellular tissue at the expense of the brain's cells and fibers), which perhaps is responsible for this considerable volume—at least for some individuals of the series. Be that as it may, one might conclude from the preceding that, in general, the murderers I examined had a more developed skull than the skulls I compared them to, and that in order to find analogues to this series one ought to go back to the prehistoric era.

The horizontal circumference presents less accentuated differences, though in the same sense. On average it is 52.39 centimeters. One must go back in time to Cro-Magnon man and the Solutrean Period in order to find a higher average. I have compared these measurements to those that Doctor Le Bon found among different classes of Parisian society. The measurements of Doctor Le Bon have been taken on the living, mine on the dry skull; it is by way of calculation that I have been able to compare my measurements to those that had been taken on the living. To this end I availed myself of the empirical formula devised by Doctor Broca (it consists, messieurs, of adding 29.26 millimeters to the measurement taken on the skull).

Here is the table where you can see the comparison between the numbers.

Comparative Horizontal Circumference

Horiz. Circum. in centimeters	Savants	Middle class persons	Nobles	Domestics	Murderers
51-52	0.0	0.0	0.0	0.0	5.55
52-53	0.0	0.6	0.0	1.8	8.33
53-54	2.0	1.9	3.7	5.4	13.80
54-55	4.0	6.2	9.2	5.4	25.00
55-56	6.0	14.0	12.8	33.9	13.80
56-57	18.0	24.0	28.5	42.8	16.60
57-58	36.0	24.5	22.0	10.7	11.11
58-59	18.0	14.0	12.0	0.0	0.00
59-60	8.0	7.0	8.0	0.0	2.61
60-61	6.0	3.3	1.8	0.0	2.61
61-62	2.0	1.8	0.0	0.0	0.00
62-62.5	0.0	0.7	0.9	0.0	0.00
	100.0	98.0	98.9	100.0	96.41

Now, this distribution is remarkable; it shows us that the horizontal circumferences of the savants group themselves around 57 to 58 centimeters. For the middle class persons you can see that this grouping is less plainly divided; likewise the nobles' horizontal

circumferences seem less well divided. For domestics they are rather grouped around 55 to 57 centimeters. Lastly, the murderers present a grouping whose range is below that of the domestics.

Cephalic index. — The average cephalic index of these murderers is 78.23. They are therefore mesocephalic; but, they are more dolichocephalic than the skulls of the West Cemetery (79.14) or than the ones found in both the Cemetery of the Innocents (78.94) and in the Cemetery of the Cité (78.58). However, they are less dolichocephalic than the Merovingians (77.01). Now, these findings are quite opposite from the conclusion reached by Professor Lombroso, who regards murderers as being either brachycephalic or microcephalic; I have found that the skulls of the murderers I studied are neither of these.

Subcerebral curve. — The murderers that I examined had very developed superciliary ridges. Gall placed at this level the *sense of locality*; he added that many persons endowed with very prominent superciliary ridges will be found to possess a fickle, nomadic, and adventurous temperament.

Be that as it may, it is necessary to go all the way back to the Solutrean Period in order to find skulls having superciliary ridges approaching, though still falling short of, those of the murderers (2.63 millimeters). If, instead of considering absolute totals, one only troubles oneself with the ratio of these numbers to the entire antero-posterior curve of the head, one finds it to be 7.32% for the murderers; this is a huge ratio, which is similar only to the one found for the Merovingians.

Frontal curve. — The frontal curve is more deficient among the murderers than with any present or past race of our country. This result is arrived at whether one compares the absolute numbers (111 millimeters on the skulls of the West Cemetery, more than 100 with all the others, and 99.8 with the murderers) or whether one only considers the ratio of this curve to the entirety of the skull circumference (26.9% with the murderers, 29% for the Middle Ages and present day, and 27-28% for prehistoric times).

So, the craniometric paradox that I pointed out a few minutes ago can now be explained; for we see that, with murderers, their large cranial capacity does not signify considerable intelligence because, on the contrary, the region where the higher faculties of man reside is atrophied in them.

Anterior semicircumference. — You will hit upon an analogous result, messieurs, when you consider the anterior semicircumference of the skull. For when one studies this curve, one finds that over the period from the cave-dwelling days of Cro-Magnon man till now it grew from 45% to more than 48% (the total circumference of the skull being 100%).

Parietal curve. — In the parietal region the skulls of the murderers make up for and beyond what they have less of in the frontal region. This curve forms with them 34.41% of the total curve, a ratio more considerable than what skulls of the Middle Ages

or modern era possess, but it is very similar to what one finds in Stone Age skulls.

It is particularly notable that the corresponding region of the brain (this is the part above the frontal convolutions and intraparietal) is regarded as the seat of the motor centers; this region, in fact, is where Doctor Mierzejewski viewed atrophy in an apathetic microcephalic, and, on the other hand, hypertrophy in agitated persons.

In short, less of the frontal region and more of the parietal region will therefore signify less reflection and more action; this is true as much with the prehistoric savage as with a present-day murderer. And, messieurs, aren't these two qualities, in fact, probably common to them?

Occipital curve. — In general (and aside for two exceptions), the occipital part of the circumference of the head of the murderers approaches that which is observed in other men.

Vertical height. — On average the vertical height of the murderers' skulls surpasses by a little that of the Auvergnats, skulls of which I have measured in the anthropology laboratory (135.9 millimeters versus 130.4 millimeters).

Stephanic index. — This index is elevated in the skulls of the murderers, as my table indicates. The maximum width of the forehead (upper diameter) is therefore smaller among the murderers than with the others (various present-day classes of Parisian society). On the other hand, the lower diameter (nonintellectual, but osseous) is somewhat larger with them.

Frontal index. — The frontal index of the murderers is raised (70.36); a more exact analysis shows that this result is due, not to the shape of their forehead, but to the reduction of the transverse diameter.

Simplicity of the frontal suture. — In 25% of the cases I found the murderers' frontal suture to be either hardly or not at all scalloped.

Now, from all these measurements one is permitted to conclude that the average of the murderers presents a notable intellectual inferiority; this lack of intelligence among them is so much the more perceptible that the tendency to motor action, activity, and excitation correspondingly appears more considerable.

The murderers that I studied were therefore born with qualities that characterized prehistoric races, qualities which have disappeared in present-day races, but which sometimes reappear by a sort of atavism.

The criminal, thus understood, is an anachronism—a savage in civilized lands, a kind of monster, and something comparable to an animal who, being the offspring of generations of domesticated, tamed, and work-habituated forefathers, abruptly appears with the indomitable savagery of its first ancestors. Among domesticated animals you see

examples of this genre; these restive, unmanageable, and contumacious animals are the criminals.

Indeed, today's criminal has made his appearance too late; more than one, in the prehistoric era, would have been a respected chief of his tribe.

In sum, we are right in thinking that one is *born* criminal. The next part of my talk, messieurs, will demonstrate that one may also *become* one; it revolves, in effect, around the pathology of the skulls of criminals. I should mention that my findings in this area I presented as well to the *Congress of Anthropological Sciences* last year.

Now, it turns out that the skulls of criminals are very frequently subject to lesions, as you can see in the following small table. Among the skulls of criminals examined, I found:

Normal skulls.	3 . . .	8.33%
Abnormal skulls, but not		
Plainly pathological.	12 . . .	33.33%
Pathological skulls.	31 . . .	58.33%

The anomalies observed are: asymmetry, the projection of the occipital, and also the projection of the frontal.

The pathological characteristics are: a lesion at the suture, ossification troubles at the occipito-parietal suture, eburnation of the sagital, total eburnation, bone injury, displacement of bone, loss of substance, etc.

This skull pathology study of mine ensued as a result of my making a certain number of observations analogous to those that the doctor makes at the bedside of a sick person. What I did was note the life and crimes of a murderer as described in the *Tribunals Gazette*, and then I compared to these sad histories the description of the diverse lesions identified in the same guillotined murderer.

Naturally, heredity plays an important role in the etiology of crime. However, it is likely that a proper education will correct the child who is born with a tendency to commit crime, and will above all prevent the development of this wretched disposition.

By June Franck had nearly completed his Piano Quintet. He had been away from Paris for a few weeks, and upon his return informed d'Indy and me, "I have worked well during my vacation, you will see. I think that you will be content." I recall that Franck, with a serene smile illumining his face, then sat down at the piano, pulled out the Quintet's score, and proceeded to play the entire piece in its then existent state of being. This splendid Quintet, oh how I can still hear it—what glorious sounds!—and can best describe the work as being an intoxicating blend of logical intricacies and expressive melodies, combined with interpolated themes and their suggestions that occur throughout. My own musical background, though limited, was sufficient for me to fully appreciate the moment: I was witness to greatness performing greatness—in the equivalent of a command performance setting no less! Incidentally, you might find it of interest that Franck never believed it beneath his dignity to solicit criticisms and suggestions on improvements from his advanced pupils (much like how Le Bon interacted with us in our understudy years); this he did on this occasion as well, modifying certain subsidiary motives in the second and third movements at d'Indy's urging.

Well, the goings-on at the June 5th meeting of the Society could hardly compare to the above, but nonetheless I believe you'll very much enjoy the following presentations made on that date by Durand de Gros, Doctor Piétrement, and Doctor Broca. I must remark that the hypothesis propounded by Piétrement that an ancient tribe of Germans is the source of the small blond population found today in Persia is in all likelihood true; however, if you reread de Uffahry's paper on Kohistan, you'll see that Topinard (who else?) would probably have given the Cimmerians credit, overlooking in the process the report of such a credible historian as Herodotus.

“The Noble Races of Aveyron”

by Durand de Gros

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of June 5, 1879

I have the honor today of placing before the eyes of the Society some specimens chosen randomly from four series of Aveyronian skulls which I have recently donated to our museum, where you may study them *in extenso*.

These four series of skulls originating from Aveyron are as follows:

The first, encompassing prehistoric times, is composed of skulls dating from the era of caves, dolmens, etc.;

The second dates from the Gallo-Roman period;

The third is comprised of 130 skulls gathered by me from an old sepulcher located in the city of Rodez. This sepulcher, it is believed, was built in the Middle Ages; it is characterized by the presence of very small earthen vessels of which many samples have been placed, in my shipment, near the skulls that they were found close to and which might permit us to determine the date of inhumation.

The fourth series is formed of a completely modern ossuary, having belonged to a rural parish in the environs of Rodez, and which I have succeeded in procuring, not without great difficulties; only the love of science provided me the will of having dared such an undertaking. Added to the pieces originating from this ossuary are several others, also extracted from modern rural tombs, which have been offered to the Society by another Aveyronian, our colleague Doctor Albespy. This series contains about 60 skulls.

Messieurs, you will be struck by two things: first, by the uniformity of type uniting all the subjects making up each of these series; secondly, by the profound difference that separates the cranial type of our modern rural population from that of both the urban population of Rodez of the Middle Ages and all the earlier populations of the region. I must here express my regret that my collection (which I have not given up from completing later on) presents an important gap; that is, it needs to be made complete with the inclusion of a series of rural skulls dating from various periods of the Middle Ages.

All the Aveyronian prehistoric skulls are dolichocephalic, their cephalic index varying from 76 to 78; each skull's contour is quite harmonious, the lines smooth, but all these skulls are inferior. Some of them are very large, particularly those found in certain caves. The occiput is very developed in each.

All the Gallo-Roman period skulls are likewise dolichocephalic, but they possess

greater height than the preceding, and some of them (those found within the walls of Rodez) appreciably surpass in volume the average of the prehistoric ones. The contours of these skulls are also very good-looking.

The ensemble of skulls of the third series (Middle Ages period urban population of Rodez) is divided between those that are dolichocephalic and the rest which turn out to be mesocephalic. Certain ones are remarkable for their large volume. The occipital protuberance is pronounced in all of them. Additionally, they have very regular curves. The cephalic index ranges from 77 to 82.

All the skulls of the fourth series are brachycephalic, with their cephalic index never falling below 83, while it goes up as far as 90. These skulls are further conspicuous by a great height of the vertex, by the width of the frontal region, by a complete effacement of the occiput, and by the unevenness of the surface. This cranial type is, moreover, entirely like that which has been ascertained by many thousands of cephalometric measurements taken by me on the people living today in Aveyron; these measurements, incidentally, appeared in the analytic tables that I prepared and displayed at the last Paris Universal Exposition.

It results from this comparative examination that the human population that one observes today in Aveyron presents a conformation of the head totally different from that which we notice in the fairly large number of skeletons that are left to us from the populations who lived once upon a time on the same soil. Where do we search for the causes of such a complete change of type? Must the explanation of this change require that a transformation phenomenon occurred in the same race? But, if so, what are the unexpected revolutions in the local conditions of the habitat that are able to account for such a revolution in the make-up of the inhabitants? Alas, we do not perceive such revolutions anywhere. So, must our search for an explanation therefore, on the contrary, call for the entire substitution of one race for another? But such an event, which would have necessarily taken place in historic times and also after the Gallo-Roman period ended, does not find its place anywhere in the outline of our nation's history. This new race which would have devoured the old one, might it be then one of the German invaders of the 15th Century and subsequent centuries? No, because it is well-known that these invaders were relatively few in number; moreover, and there is no doubt about this, their anthropological characteristics taken as a whole were entirely different from those of our present-day Aveyronians.

There is still less room to investigate this matter if the Moors, Normans, and English had substituted the population that they found in possession of Aveyron for one of their own race, which would thereby leave only the birds to pitch similar questions.

What is therefore the answer to this enigma? I have come to believe that the individuals whose remains we find in the old sepulchers belonged to a privileged social category (because tombs constructed at great expense were never made for the common people), and it is quite permissible to suppose that they constituted a caste having an ethnic origin other than that of the multitude. As for what accounts for the marked difference

between the cranial type of present-day rural Aveyronians and that of the urban population of Rodez of the 13th and 14th Century, its explanation can be found in the following considerations: firstly, the foreign immigration, more or less of importance with respect to the cities and hardly of any account to the countryside, ought to have extended the cranial type differentiation between the city dwellers and the peasants, these latter being extraordinarily brachycephalic, while among the former the cephalic index was low, naturally producing a difference between the two groups. Secondly, it seems likely that a substantially greater proportion of the descendants of the old ruling castes lived in the city than in the countryside. Finally, a third cause may be invoked, and this is probably the principal cause: the *dolichocephalant* influence of the urban milieu, described by me for fifteen years, and which the earlier comparative cephalometric studies that I had conducted, on the one hand, on Aveyronian conscripts and, on the other, on young people 18 years old or more attending various schools in Rodez, appear to place beyond doubt.

The anthropology of Aveyron offers to the observer an interesting phenomenon which I have previously brought to your attention, and which I'm thankful for the occasion to speak to you about again. In Aveyron there exist a great number of families of old nobility stock; among *all* predominates a special physical type characterized by blond hair, blue eyes, a white, ruddy complexion, and a slender build associated with an above average height. Now, whereas *every one* of these aforementioned nobles are blonds, nearly without exception the Aveyronian population does not offer up *two* blonds out of every *fifteen* individuals. This opposition of types incontestably gives notice of a difference between the corresponding races. It seems to me that our blond country squires in Aveyron not only are the most direct descendants of the Frank and Visigoth rulers of our region, but also are the descendants of the Gaulish noblesse.

This view furnishes, I believe, a satisfactory solution to a problem of anthropological history that has been the object of interminable discussions within this very room and elsewhere.

The Gauls, as described by the historians, were tall, blond and lymphatic; on the other hand, it is indubitable that about nine-tenths of the modern-day inhabitants of Gaul are short and stocky, brunet and sanguine. Are these latter people then not the descendants of the Gauls? This is a paradox to resolve, as it has proven to be insolvable up to now. I shall content myself here to remind you of the very insightful opinion our eminent colleague, Doctor Broca, has expressed on this subject. He supposes that the tall, blond and white Gauls, whose likeness the Roman and Greek writers have portrayed to us (all in an identical manner), lived in eastern Gaul and were the *Belgae*, whereas western and central Gaul (Celtic Gaul) were peopled by a totally different race, this race being like the one which we observe today inhabiting the same region. Doctor Broca finds confirmation in his viewpoint from the very tall heights that, in an exception unique in France, are undeniably manifest among a certain number of conscripts from the departments of Ain and Doubs.

I must take the liberty to observe firstly that the two departments in question

form the region where the “Burgundy giants” lived who, according to the testimony of Apollinaris Sidonius, possessed a *height of seven feet*, and who one may regard as the ancestors of the extraordinarily tall individuals that one encounters nowadays in this part of France.

Secondly, I ask that you give careful consideration to the fact that the classic portrait of the Gauls most likely has no reference nor exception to those inhabiting any part of ancient Gaul, and that, in reality, the Greek and Roman writers, whenever the opportunity presented itself, characterized as blonds tribes belonging to the Celtic race. For example, one of these writers talks about the *flavi Carnuti*; Claudian, who wrote in the fifth century, declares that the Gauls were blonds from the borders of the Rhine to the Garonne (*truces flavo vertice Galli quos Rhodanus... Araris... Rhenus..., unda Garumnae*, etc. Ruf., 11, 110 and so on; citation of Roget de Belloguet); additionally, the Ruthenians themselves are designated as blonds in this verse of the *Pharsalia*:

Solvuntur flavi longa statione Rutheni.

After deliberating over the causes responsible for the contrast of races observed in Aveyron, I have been led to explain in the following manner the apparently insoluble contradiction that exists between the description of the Gauls that all the ancients were in accord on and the precisely opposite traits which characterize the modern-day French. The individuals that the Greek and Roman authors had before their eyes when they produced their picturesque representation of these gigantic rutilant-haired warriors came from beyond the Alps; they were probably nobles and *equites*, who alone most likely composed the general staff of the armies as well as the high personnel of the embassies. It is quite logical to believe that the caste which ruled the Gallic nation before and after the Roman conquest was all that the foreign observer perceived of this nation; in the same way much later, after the invasion of the barbarians, the mass of the indigenous Gallo-Roman population effaced itself from his eyes behind a curtain of German dominators that, though very small in number, formed the official country and had united to substitute the national name of 12,000 foreign combatants for the one of 30 or 40 million indigenes.

In short, I believe that a race of blond inhabitants and a race of brunet inhabitants coexisted within the confines of Gaul. However, instead of being *geographically* juxtaposed, as Doctor Broca maintains, with the blonds living in the east and the brunets occupying the center of the country, the two races were *socially superposed* over all points of the country; the blond race formed a very thin layer at the top of Gallic society, but this layer, like a cake's icing, concealed and covered up the thick stratum of the lower classes.

I must add that my view does not essentially differ from the opinion expressed on this same subject, and defended with as much sagacity as erudition, by Monsieur Roget de Belloguet in his *Ethnogenie gauloise*, under the heading *Types gaulois et celto-bretons*.

It is professed—upon what evidence I do not know—that the Gallic blonds and Frankish blonds were all dolichocephalics. Probably it was under the influence of this doctrine that Monsieur Girard de Rialle, in a report concerning a memoir presented by

me to the Society several years ago, stated that the blond noblesse of Rouergue is also dolichocephalic. This is exactly the opposite of what I have gone to the trouble of proving, and I am compelled to declare again that within the Aveyronian population the blonds are just as much brachycephalics as the brunets.

Finally, messieurs, I would like to bring to your attention a few other observations that I have made in studying the population of my department.

The table of colors of the iris, which is appended to the *Anthropological Instructions* published by the Society, is most insufficient. It only shows uniform tints, but the iris is not always colored this way in nature. For example, I have found among the Aveyronians a great number of multicolored eyes, where the different colors are distributed in accordance with diverse modes of arrangement: in certain cases in concentric circles, in some others in a regular mosaic pattern; there are lastly certain irises that present a uniform background, most often blue, which, however, is irregularly stained with an entirely contrary hue. I have often been able to establish that these irises having many colors coincide with a crossbreeding some time in the past of the two types—blond and brunet; but, my observations in this regard are not sufficient enough for me to draw up a general rule. While I'm at it, I might as well mention one other fact that applies to some particular cases; this is that, based on my investigations that were much too limited in extent, adult individuals in Aveyron who possess blue eyes and dark hair had been blonds in their infancy.

DISCUSSION

Monsieur PAUL DE JOUVENCEL. It seems to me that the noble population of Aveyron is more likely connected with the Visigoth invasion. I have it on the authority of a Spaniard from northern Spain that very many nobles of this region are blonds, tall, strong and have white skin; their presence is attributed firstly to the Visigoth invasion and secondly to the Moorish conquest, which drove them back into the mountains. The coat of arms of these nobles bears witness, it is said, to their origin.

I find, Monsieur de Gros, in the description you gave of the nobles of your region the same qualities as the ones possessed by the nobles of northern Spain, and I ask if they ought not to be linked to the same origin. The Visigoths, it must be noted, had been very numerous in southern Gaul, establishing a kingdom there; after having conquered them, the Franks were content to greatly abate the power of the Visigoths without substituting themselves for them. With the Visigoth nobility of southern Gaul therefore not being obliged to cease their forming a caste, it is natural that today it distinguishes itself from the rest of the autochthonous population, a population with which it has never intermixed.

In Auvergne, on the other hand, we find a very ancient nobility presenting the same anthropological qualities as the population of the region; why? because without a doubt it is entirely Gallic, as are all the surrounding common people.

Monsieur DURAND DE GROS. To answer your question. Monsieur de Jouvencel, the physical qualities of the Visigoths happen to resemble those of the Franks. Additionally, we

know that the Gallic chiefs had not been ousted by the invasion of foreigners, as they played the same role with the invaders as they had vis-a-vis the Romans. Displaying contempt for the common people, the Gallic chiefs had a secret understanding with the invaders, which gained for them the preservation of their wealth and well-being. Monsieur Fustel de Coulanges and others testify to this. I therefore believe that the Gallic nobility of Rouergue had not been ousted and dispossessed by the Visigoths and Franks, but instead merely restored to its former position, refreshed (if I may be permitted to express myself thusly) by the invaders' passage.

Monsieur GABRIEL DE MORTILLET. I fear that the basic assumption underlying this entire discussion is erroneous. You cannot, Monsieur de Gros and Monsieur de Jouvencel, separate so to speak the nobility from the races that adjoin it; you keep supposing that the nobility is practically penned up when, in fact, it has never been such. Nobles very often contract distant marriages, and also they sometimes get married for the express purpose of becoming lords of many properties and to augment their riches. You know, besides, that in former times marriage with commoners did not tarnish the nobility: nobles would contract a certain number of these marriages in order to increase their fortune. Finally, today's discussion has not taken into account bastards, that is, those who are a mixture of noble and common blood. For all these reasons nobles do not constitute a type apart.

Now, Monsieur de Jouvencel, you stated that nobles are quite often strong and tall, and you said much the same in your talk, Monsieur de Gros. There is a good explanation as to why nobles frequently possess these qualities; it happens that if one of their infants is puny or dwarfed, he will generally be made to enter into the clergy. Therefore amongst the nobility only men capable of being fine soldiers are called upon to marry and reproduce.

Monsieur PAUL DE JOUVENCEL. The facts that I have cited relative to the nobles of northern Spain are well established; if the ones that you cited, Monsieur de Gros, are the same, then this produces two instances of facts that demonstrate that one can have within a country a special type of nobility. Many Spanish Houses possess titles which give proof of their antiquity; several of them, just like certain Italian families, go back as far as the Romans. Can one therefore be astonished to see families, whose origin in the distant past is authentically verified, maintain an ethnic type that traverses the ages?

“On the Existence of Blonds in Persia”

by Doctor Charles Piétrement

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of June 5, 1879

At our March 20th meeting Marquis de Nadaillac was the only member of the Society who was able to provide positive information evidencing the presence today of blond persons in Persia, this information being based on the account of a Persian prince. At this time, messieurs, I would like to bring to your attention much more precise information which confirms what Marquis de Nadaillac shared with us previously. My friend, Monsieur Léon Rodet, a manufacturing engineer for the State, is in regular contact with the Persian physician Mirza Mohammed who, for more than two years, resided in Paris where he attended classes at the Faculty of Medicine. Mirza Mohammed understands and writes French well, but he does not speak it fluently. As for Monsieur Rodet, besides Sanskrit, Zend, and Pahlavi, he understands several of the modern dialects of India and Persia. I enter into these details in order to explain why Mirza Mohammed has not himself come before the Society to present his facts concerning blonds in Persia, and to point out that he is able to submit them very clearly to Monsieur Rodet. Here now is his information, as contained in excerpts from a letter that Monsieur Rodet wrote me May 3rd:

“I posed to Doctor Mirza Mohammed the question that was discussed the other day at the Anthropology Society. There definitely exists in Persia individuals of the blond type, who are so commonplace throughout the land that, just like amongst ourselves, in the same family the two main color types—light and dark—often appear together. This is what has occurred, for example, in Mirza Mohammed's family: of his four children, one—the second—is blond with reddish brown eyes and very light skin, whereas the three others possess, like their father and mother, dark hair and a swarthy complexion. They live in Kermanshah, a city that one passes through before reaching southern Persia. The young blond son owes his appearance to his maternal grandfather, who is blond with blue eyes.

“Mirza Mohammed estimates that an average of 2 out of 100 persons in the entire Persian population are blonds; this ratio decreases to 2 out of 1,000 in the southern province of Shiraz (ancient Susiana), and conversely increases as one goes north.

“According to ancient tradition which places, as you know, the *devs* (or, as we call them today by the Arabic word, *sheitans*) in the far north, all blonds are considered to be *sheitans*, that is to say, satans, demons, and goblins. Contrary to what we find here in France, where blonds often possess a lymphatic temperament which renders them weak and indolent, in general the *sheitans* of Persia are lively and sharp, which helps justify the qualification tradition has conferred on them.

“These then, my dear colleague¹, are the revealing facts which have been provided by a most competent person.”

¹ Monsieur Rodet is a fellow member of the Society of Veterinary Medicine.

Such are the records of Doctor Mirza Mohammed that came to me thanks to the intermediation of Monsieur Rodet. They seem to corroborate the two opinions that I expressed at the March 6th meeting, which were namely the following: firstly, the Avestan legend of Ormuzd vanquishing Ahriman and subjecting him to his will (*Yashts*, XV, 10-13, and XIX, 29) appears to me to be an allusion to a very ancient subjugation of a group of blond-haired people by dark-haired people; and secondly, I am disposed to regard the Aryan-like blonds seen today in Persia as descendants of a tribe of Germans, which Herodotus (I, 125) represents as having already come under the submission of the Persians before the era of Cyrus the Great.

“The Skull and Brain of a Man Afflicted with the Toulousian Deformation”

by Doctor Paul Broca

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of June 5, 1879

Today I shall present from the hand of Monsieur Nélaton, a resident medical student in the service of Doctor Richet at the main hospital, the skull and brain of a 60-year-old man, upon whom an autopsy was performed this morning; this man was born in Albi (Tarn), but his head is deformed *à la Toulousaine*. The Volcae-Tectosages, from whom we attribute the importance of this deformation, had their capital in Toulouse and supposedly, according to the maps, had only extended themselves as far as the Agout River, which is 8 leagues from Albi. But, we believe, from the manner in which they had ushered themselves into the country, that they were able to extend themselves much further, even into Aveyron (where examples of their presence are known).

In an odd coincidence another man, 37 years of age and afflicted with the same deformation, died this morning in the main hospital; he was also born in the department of Tarn, but on the border of Haute-Garonne and in the territory of the ancient Tectosages.

You recall, messieurs, that in April, 1871 I performed an autopsy on an old Toulousian whose skull and braincase are now deposited in our museum. Today's autopsy is therefore the second that has been performed on such an individual, and it confirms the results of the first as well as supports the opinion sustained for 130 years by the Toulousian physicians specializing in mental disorders.

The Toulousian deformation had been widely regarded with indifference, and remained ignored until the physicians working in the lunatic asylums of this region noted that the percentage of deformed persons was much more considerable in the population of their asylums than in the at large population. They concluded, with reason, that the practice of placing caps tightly on the heads of infants was dangerous for the intelligence; they then undertook a sort of crusade after which most families in this region renounced the employment of child's caps, having now understood that such caps could deform in a harmful manner the head of young children.

Regarding the Toulousian that I autopsied in 1871, I described at the time the pathological adherence of the dura mater with the skull's inner lining. Usually, to remove the brainpan of the skull, one makes a cut with a circular saw, after which one detaches the brainpan without any difficulty, drawing it off by means of a small hook. When I tried to perform this particular operation on the Toulousian, the brainpan did not surrender itself, and when I sought out the obstacle that was causing the resistance, I saw that it was the dura mater which was adhering very strongly to the skull and which would not

be able to be detached with ease. Upon further investigation I saw that this membrane was threatening to tear; so, I cut it all round about the side where it was adhering. This adherence was obviously due to an old malady that enveloped the brain.

Now, the same difficulty occurs when you do an autopsy on the 60-year-old individual that I have chosen to present to you today, whose skull here has been prepared for examination. As you can see, traces of the adherence of the dura mater are readily visible; at this level of the skull we observe a great number of small depressions (which I'm now delineating with a needle), from the bottom of which the dura mater is intimately adherent to the skull.

So, artificially deforming an infant's head is no innocuous process, as it is often described, even with regard to the much more violent deformations performed by various South American peoples. We do not know at what point it became injurious to the two individuals whose autopsy I have described, but one thing is certain: with both of them it brought about a lesion that beset the brain and skull.

The exterior form of the subject's skull, the main pieces of which we have before our eyes, is as follows: the forehead slopes up to the frontal bosses without being very deformed. Proceeding on from this point, it is extremely depressed and sunken all the way up to the bregma, and, as you can see, the head terminates in kind of a sharp peak.

The frontal lobes of the brain are so significantly deformed that their existence is not evident from the exterior aspect of the skull; indeed, messieurs, their anterior part is very depressed. They regain in length part of what they have lost in height, causing the Rolandic fissure to be compressed toward the back; however, notwithstanding this parietal compensation their relative volume is much smaller than the normal state. The occipital lobes, on the contrary, possess an exaggerated volume, while the parietal lobes are very reduced in their upper, external part.

The Toulousian deformation therefore modifies in a most considerable manner the relative development of the various lobes of the brain. These same facts have been verified by the partial weighings that I made on the brain of the Toulousian of 1871.

DISCUSSION

Monsieur ANTOINE D'ABBADIE. This custom native to the region of Toulouse of deforming the head of infants was certainly practiced with more frequency formerly than it is today. Yet, we do not see that this region is particularly remarkable for the number of its madmen; the contrary situation prevails in some other regions, and especially in the village of Guipuzcoa, where lunatics—one does not know for what cause—are prodigiously numerous. Toulouse, on the other hand, produces distinguished men—notably the mathematician Fermat—and the Toulousian population is intelligent.

Doctor JULES LUNIER. I would like, messieurs, to present to the Society this map which shows the distribution of mental illness in France; as you can see, the department of

Haute-Garonne is one of those where lunacy claims the most victims. It is conspicuous with regard to other departments of southern France, where lunacy only manifests itself rarely.

Doctor PAUL BROCA. The fact that you cited, Monsieur d'Abbadie, of a village containing an abnormally high number of lunatics without anyone knowing why this is the case can no doubt be explained by heredity alone, for there are few maladies more hereditary than lunacy. Fortunately, Monsieur Foville of Saint-Yon has shown that families struck by this malady have a propensity to die off.

As for the existence of distinguished men originating from Toulouse, this is well known and is not in contradiction with what I have previously stated. Besides the fact that the deformation custom has never been universally adopted in Toulouse, it is probable that the intelligent families, those where the men of merit generally come from, are bound the most often to be opposed to the application of a usage so absurd and uncouth; it therefore will be useful to know if the great mathematician Fermat had or did not have a deformed skull. Moreover, one can imagine that certain intellects are able to escape or resist the dangers that run with the artificial deformation.

I must add that the population of Toulouse is much more artistic and literary than scientific. It is Toulouse, for example, that gave birth to the celebrated Floral Games; its people, even down to the lowest stratum, are excited and impassioned by poetry and music. These personal qualities are not incompatible with the relatively lesser development of the frontal lobe, because they are quite often in evidence among the Toulousians who have a deformed skull.

I wish you had been with me on July 17th. I picked up Le Bon, and we went to the Society's afternoon meeting. Doctor Ardouin gave a short, though intriguing, talk regarding the cranial capacity of criminals, a follow-on to Bordier's talk in April on the skulls of murderers.

Afterwards we made our way to the corner table at Henri's, which the maitre d', in expectation of our arrival, had reserved for us. No doubt Le Bon had found inspiration in Ardouin's presentation, as he ended up spending most of our dinnertime enthusiastically detailing to me his thoughts about the causes of, and ways to protect society from, criminal behavior, a subject I had never heard him expound on before.

Our friend described how our criminal justice system was a failure in all respects but one—as a jobs program for the police, lawyers, magistrates, prison guards, and the like. As usual, Le Bon did not stop after sharply criticizing the status quo, but continued on by proposing a novel solution to the seemingly intractable problem of dealing effectively with criminals: deportation. The worst of the felons, he advocated, should be shipped off to New Caledonia or some other end-of-the-earth colony of ours, and never be allowed to return. His arguments on behalf of this cost-saving and society-protective policy I found most persuasive—and I believe you will, too, for fortunately they still exist in reviewable form; the master set them down in a magnificent paper, "The Question of Criminals," that the *Revue Philosophique* ultimately published, and which I have also enclosed for you.

It is now 50 years later, and Le Bon's deportation of criminals proposal, for all its logicalness, has yet to be adopted by the powers-that-be. And I fear our wait for that happy day will be held off for as long as the early evening breeze continues to inspirit all the hard-working souls unwinding at Henri's.

“THE QUESTION OF CRIMINALS”

by Doctor Gustave Le Bon

Revue Philosophique - July, 1881

Utilizing the resources of present-day scientific methods, we propose to consider here under the above title an important anthropological and social question, one which is hardly being studied nowadays by jurists, philosophers, and historians.

The main preoccupation of any science is always to define its aim. Definitions elicited from etymology come easily, but are generally insufficient because the object of every science, including those which seem the most organized, such as physics, for example, varies from each epoch according to the tendencies of the moment.

Anthropology is, as its name indicates, the study of man. Social science—or if one prefers another word, sociology—is the study of societies. However, these concise definitions cast a very misleading light. For where does the science of man begin or end? Physiology, anatomy, pathology, archeology, history, etc., with each one forming a part of the field of anthropology, it is indeed difficult to name many sciences that are not attached to this field by some bond. Furthermore, a professional anthropologist recently asserted that music and sculpture also comprise part of the anthropological sciences. They undoubtedly are connected by the same right that unites linguistics and demography to the sciences of man. Additionally, chemistry, which reveals to us the composition of our tissues, and the art of nutrition, which supplies us the means to restore our tissues' losses, can likewise be associated with anthropology. Looked upon in this way, anthropology will soon become nothing but an aggregate of disparate sciences and will end up disappearing for lack of an aim or purpose.

In fact, it is only necessary in any science to search for those things that are really vital in promoting its development, and not those which tend to stifle it. The anthropology of the ancients, because it had little time to gain experience, only concerned itself with moral man. The new anthropology of today only occupies itself with anatomical man. It has entirely abandoned the study of the intellectual functions, so much so that the professional anthropologist cited above does not himself make mention of psychology (although he includes music and sculpture) in the quite diversified list of anthropological sciences.

In order to pass judgment on the tendencies of modern anthropology, it is necessary then to study the works of anthropologists; however, nothing more than a quick glance is sufficient in order to learn that the principal object of their research is the study of human races. What anthropologists generally study the most in human races are variations of the skeleton's shape, particularly those relating to the skull. Such an examination certainly qualifies as a useful task, for it's better to provide value by affixing precise notions upon a small nook of science, no matter how limited this nook may be, than it is to toss out vague generalities lacking any firm basis; it is a task, though, which anthropology, under penalty of

being soon considered as only a branch of osteology and by consequence losing all credit, should not confine itself to for much longer. Indeed, pretending to understand a man just by studying his remains or skin color, this requires one to imagine and make sense out of a table containing a chemical analysis of all the colors which have served to constitute the man. The fact of the matter is, understanding the psychology of an individual will always be more important than knowing about his skeleton. Our current classifications of the human races are obviously quite provisional and cannot withstand anything more than a superficial examination; but, since we are obliged to content ourselves with these provisional classifications, they will better merit being divisions if they were founded upon the moral and intellectual aptitudes of diverse human groups than if they are fundamentally based on qualities as secondary as the shape of one's hair (which some truly childish classifications emphasize).

As for sociology, it is definitely still far from being able to lay claim to the title of science, because up to now it has hardly attempted to delineate anything but highly insufficient rough outlines. It is a science that really has not been born yet and which we see breaking through the horizon with difficulty. Sociology is not open to further development until anthropology—and I mainly intend here by “anthropology” the study of the comparative psychology of races—has left its period of infancy where it currently still finds itself.

Within these new sciences in the process of formation each one is able to communicate its ideas, but chiefly the facts and methods that it commands. The future will easily separate out what is useful from that which only merits oblivion.

In entertaining in this *Revue* questions which seem to us to fall under the purview of the two sciences that we have seen to enumerate and to which we have devoted our most recent work, we do not bring with us any preconceived ideas or doctrinal ties. This is because we have striven to remember that if it is always indispensable to have a method, it is often fatal to possess a doctrine. Although physical man will be studied, we shall also study moral man (an endeavor so disdained nowadays by anthropologists). If we only had in hand the antiquated methods of the old out-of-date psychology, then it is with reason that our study could be considered as undeserving of one's attention. But, the methods we shall use owe their existence to the work of the physiologists, whose methods enable one to approach the study of man with the precision that modern scientists employ in the study of any sort of physical phenomenon; regrettably, despite their great utility, the methods of the physiologists continue to be ignored by France's classical education system.

We shall today only consider a single question: that concerning criminals.

I

The latest capital executions and the clamorous proceedings at Bordeaux have brought new attention to a very serious question and the social consequences that it entails: the mental state of criminals.

Two entirely contradictory opinions reign today in this regard. In the eyes of most physicians, criminals are nothing but irresponsible lunatics who it is necessary to restrain by imprisonment and try to improve; by contrast, the totality of magistrates regard criminals as perverse beings whose only desire is to engage in a life of crime, and therefore must be punished. Tossed about between these contrary opinions are the juries, who acquit or condemn according to the impression produced upon them by the oratorical skill of the prosecutor or the defense. With respect to this serious question, psychology has stayed fairly neutral, as it has limited itself to general considerations concerning the determinism of actions. Rarely doubling as a physician, the psychologist is not very fond of adventuring upon this special terrain and only deals with technical questions debated between the public ministry and experts.

In fact, this question about the mental state of criminals comprises so many different aspects that it is impossible to deal with it with the insights and findings of a single science. In order to clearly understand it, it is necessary to successively examine it from the medical point of view, the psychological point of view, the judicial point of view, and lastly from the social point of view. It is by tackling this question under these various aspects that we shall now proceed to study it.

From the medical point of view, the principal problem to resolve is this: Do the brains of criminals exhibit special alterations that observation demonstrates are incompatible with the regular exercise of the faculties? Accordingly, must criminals be viewed as lunatics and treated like such?

When one sits in on the oral proceedings of the autopsy of an executed criminal—the only convict whose body must generally be examined by doctors—it is extremely rare to not meet with the inquiry verifying the presence of cerebral lesions more or less vast. As the accounts of all the various known cases cannot be enumerated here, I shall limit myself to briefly indicating the results of: 1) the autopsies of two vile persons executed in Paris, Prévost and Ménesclou, and 2) the examination of the Museum of Caen's collection of skulls of 35 guillotined individuals that Doctor Bordier has studied and which I have also had the occasion to examine and make sketches of for my research.

The brain of Prévost has been studied by Doctor Broca. Although it does not present pathological alterations properly so-called, it offers up certain peculiarities that has resulted in the illustrious anatomist declaring it to be highly abnormal.

As for the brain of Ménesclou¹, it presents considerable pathological alterations, permitting one to regard its possessor as an insane person who has already reached an extremely advanced state of mental illness. Here is, moreover, how these lesions are described

¹ The head of Ménesclou has been, on the part of Professor Sappey, the object of an experiment not previously attempted before on man, and consisted of trying to restore the life and thought of a cut-off head, by the injection of blood. The head was not reconnected to Ménesclou because, as a consequence of administrative formalities, five hours had elapsed between the execution and the delivery of the subject's body to the laboratory,

by Monsieur Chudzinski, the skillful preparator of the laboratory of anthropology: “The frontal lobe, with two symmetrical sides, suffers from a most pronounced cerebral softening, as does the first and second parietal circumvolutions. The first and second temporal circumvolutions are softened as well, but to a lesser degree. Both sides of the occipital lobe display traces of softening. The brain is on the whole so softened that one will experience difficulty in making a cast of it. The pia mater and arachnoid membrane are very tough and thick, just like one finds with the quadrupeds. The main fold of the occipito-parietal passage is deep and bends toward the brain case on the right side; it is normal on the left.”

With regards to the skulls of the 35 guillotined persons at the Museum of Caen, they have furnished to Doctor Bordier analogous results. Nearly all (92%) were abnormal or pathological, with 21% containing osseous lesions along with lesions of the brain case (these both implying grave alterations of the brain). Among the anomalies or alterations noted by him, the following were primarily detected: considerable development of the brow ridges; weak development of the frontal region, but considerable development of the parietal and occipital regions and consequently of the cranial capacity itself; frequent lesions at the sutures. Some day I'll complete these indications by analyzing their modifications of form, whenever I come across the time to study the geometrical drawings that I have taken of this series of skulls, drawings which figure prominently in my already numerous collection of craniological sketches.

These recent investigations only confirm, I repeat, what previous examinations of the brains of executed criminals have shown: very high frequency of abnormal or pathological qualities. Now,

and the tissues had already lost a part of their properties. The first person to conduct this type of interesting experiment was Brown-Séquard, who performed it upon a dog. Here is how this experiment has been related by him: “I decapitated a dog by taking care to make the division below the spot where the vertebral arteries penetrated their respective osseous canals. Ten minutes after the cessation of respiratory movements from the nostrils, lips and lower jaw, I fitted the four arterial gaps of the head with cannulas which were connected by rubber tubes to a copper cylinder through which, with the aid of a syringe, I injected oxygen-charged blood. In two or three minutes, after some faint disorderly movements, I saw visible movements of the eyes and muscles of the face *that seemed to be directed by the will*. I prolonged the experiment for another quarter of an hour, and during this entire period these movements, in appearance voluntary, continued to take place. After having discontinued the injection of blood, these movements ceased and were soon replaced by convulsions of the eyes and face, by respiratory movements of the nostrils, lips, and jaws, and then by the tremblings of agony. The pupil of the eye became dilated and then contracted like it does in ordinary death.”

Recalling this strange experiment, Professor Vulpian expressed himself thusly: “If a physiologist attempted this experiment upon the head of an executed criminal, he might be witness to a great and terrible spectacle; he might restore to this head its cerebral functions; he might awaken in the eyes and facial muscles movements that with man are aroused by passions and thoughts, whose source is the brain.”

This experiment, which enables one to restore at will a cadaver—simply by maneuvering a stopper—this thing so seemingly incorporeal, called the soul by the spiritualists, will surely prove to be most curious. Nothing will be easier than to set up, utilizing conventional signs, a regular conversation with this cut-off head. The experiment evidently could be prolonged for days or months, seeing that it will suffice to maintain a regular circulation of blood in the vessels of the brain by connecting these vessels in an uninterrupted fashion to those of an animal, upon whose body one perhaps might succeed in grafting the head. One could also vary the experiment in an interesting way by slowing down or accelerating the circulation, by adding to the blood different stimulating substances, such as tea, alcohol, etc., which are able to alter among living persons the mode of operation of the cerebral cells, etc.

as the brain does not present from the anatomical point of view abnormal or pathological qualities without its functions undergoing corresponding troubles, we can conclude that the above-confirmed pathological anatomy clearly justifies, at least for all the cases where such lesions are observed, what so many physicians have maintained for along time: that criminals are more or less abnormal or pathological, that is to say, more or less lunatics.

Irreproachable from the physiological standpoint, this conclusion might be challenged by persons who are ignorant of the fact that lesions of the brain are always accompanied by disturbances of its functions. Having investigated this matter sufficiently, we shall set aside our consideration of anatomical lesions, and shall now see what psychological observation reveals about the mental constitution of criminals.

II

In order to truly understand the mental state of criminals, we shall explore the insights and findings of those persons accustomed to frequently dealing with criminals and who also possess a sufficient dose of the spirit of observation. The medical experts who testify at trials being the only ones meeting this condition, it is to them that we shall ask for information. The views and opinions that they profess, moreover, hardly vary. They are pretty well summarized by the following passage that I have seen fit to borrow from one of the most highly regarded and authoritative of such experts, Doctor Maudsley, Professor of Forensic Medicine in England:

The vile criminal is not a scoundrel by the deliberate choice of pursuing the advantages of wickedness through trickery or for the sheer joy of carrying out villainy through ambush, but rather by an inclination of his nature which makes wrong-doing to him seem good and doing good seem wrong. The fact that he generally surrenders to the allurements of instant gratification in spite of the likelihood or certainty of punishment or future suffering is proof not only of his natural affinity for evil, but also of a lack of intelligence and a weakness of the Will. The most experienced and reserved superintendents of prisons sooner or later become convinced that there is no hope whatsoever in reforming habitual criminals. "The sad realities that I have observed," noted Mr. Chesterton, "compel me to say that at least nine tenths of the habitual malefactors do not have the desire nor the intention of renouncing their way of life; they are in love with the vices to which they are addicted. . ." I have heard a young rogue proclaim, "Oh God, how good it is to steal! Whenever I have millions myself, I will still want to be a thief."

All those who have studied criminals know that there exists a distinct class of people devoted to evil; these miscreants congregate in our large cities in the thieves quarter, devoting themselves to intemperance, vice, and debauchery, with no cares for the bonds of marriage or the hindrances of consanguinity, and wholly propagate a criminal population of degenerate beings. For it is yet another observable fact that the criminal class constitutes a degenerate or morbid variety of the human species and is marked by specific qualities of

physical or mental inferiority. This group of individuals, it is rightly said, is just as distinctly recognizable as is a class of honest workers, and possesses the same “good birth” as that of a black sheep.

In addition, Doctor Maudsley concludes that those who have seriously studied the question have discovered that the amelioration of criminals is the most unrealizable of chimeras. He states: “A genuine improvement in a person's conduct involves the reformation of the nature of the individual.” But how can that which is formed by the succession of generations be reformed in the course of a single life? Can a Moor change his skin or a leopard its spots?

While entirely sharing in a general way the very sound opinion of Doctor Maudsley, I believe that the author, and likewise the other forensic doctors, the majority of whom possess very little psychological training, do not know how to recognize among criminals certain very important distinctions. Heredity is certainly one of the principal factors of criminality; but, if one is often born a criminal, one can also sometimes turn into one. How can a person develop into a criminal? This is what we shall now try to explain and demonstrate.

From the psychological point of view, I shall first set up two primary classifications of criminals. These classifications, which totally stand out, are: 1) *criminals because of heredity*, and 2) *criminals because of acquired lesions to the brain*. These two large fundamental classes themselves include subdivisions entirely distinct, as we shall now proceed to substantiate.

Heading the category of hereditarily disposed criminals are, naturally, those individuals whose vicious dispositions have regularly been transmitted from father to son and who generally end up in jail, prison, or on the scaffold. It is from the midst of such individuals that great numbers of criminals are recruited. Repressive means have absolutely no preventative action upon them; only the fear of the death penalty sometimes prevents them from going ahead with committing murder. Illustrating one example from this category of criminals, I shall cite that of the Jean Chrétien family, about whom Doctor Despine has noted:

Jean Chrétien, of vulgar stock, had three children: Pierre, Thomas and Jean-Baptiste. — I. Pierre had a son, Jean-François, sentenced for life to hard labor for theft and murder. — II. Thomas had: 1) François, condemned to hard labor for murder; 2) Martin, sentenced to death for murder. The son of Martin is dead in Cayenne on account of robbery. — III. Jean-Baptiste had a son, Jean-François, who was husband to Marie Tanré (from a family of arsonists). This Jean-François had seven children: 1) Jean-François, convicted of many thefts, died in prison; 2) Benoit fell down from a house-top that he was scaling and died; 3) X., called Clam, was imprisoned for various robberies, and died at age 25; 4) Marie-Reine died in prison, having been convicted of thievery; 5) Marie-Rose—same outcome, same acts; 6) Victor is currently detained for theft; 7) Victorine is married to Lemaire, whose son is sentenced to death for stealing and committing murder.

Galton cites the case of the Jecker family in America, whose genealogy has been traced as far back as seven generations; this family line contained 540 members, of which a considerable number have ended up in jail, prison, or hung from the gallows.

Outside of these persons born as criminals (like those born hunch-backed, cancerous or consumptive), and which nothing can prevent them from becoming criminals, we find several categories of individuals who undoubtedly owe to heredity many dispositions which could lead them to a life of crime, but who, with these same dispositions, have been able to carry out very different acts. Such individuals are firstly those persons that I have named impulsives, that is to say, those natures in whom—as is likewise the case with savages, women and infants—the impulse of the moment is the motive force behind their conduct. The barriers that interpose reason between fleeting thoughts and action among individuals comprise a superior form of evolution not existing among impulsives. Depending on the conscious or subconscious motives that serve to excite these quick-natured souls, crime and virtue are equally easy for them to perform. Committing with the same ease the most heroic acts or the meanest crimes, they fling themselves into flames at the peril of their lives in order to save a stranger, or slay without hesitation the person who becomes the object of their hatred. Entire nations and peoples have possessed such qualities. For example, the Italians of the Middle Ages and their descendants living at the commencement of the Renaissance furnish us the perfect type¹. In complicated and methodical civilizations like our own, qualities like impulsiveness often reappear by means of atavism, but they are too poorly adapted to the present milieu in order to not be fatally condemned to disappear.

¹ It is sufficient, for want of the histories and chronicles of the times pertaining to Florence, for example, to read the *Memoires* of Benvenuto Cellini in order to gain an accurate idea of what most of the psychological qualities possessed by the Italians were back then. Cecchino, the brother of Cellini, having learned that one of his friends had been killed by soldiers on the watch, “cried out with rage so loudly that it might have been heard ten miles away.” Having been shown who the perpetrator of the murder was, Cecchino immediately hurled himself upon the soldier and thrust his sword through the man's stomach. The comrades of the deceased in turn pounced upon Cecchino, and one of them, a corporal, mortally wounded him. Cellini immediately decided to avenge his brother's death, but, having been prevented by his friends from doing so, he let his enemy go; but weeks later he surprised the corporal and tried to cut the soldier's head off with a dagger. The victim, dangerously injured, began to flee; but Cellini caught up to him and drove his dagger into the corporal's back with so much force that he was unable to pull it out. The Pope learned about the affair; but, because His Holiness was in a good mood that day, he did not attach any importance to it.

The Pope, moreover, possessed this same impulsive quality which was characteristic of all his contemporaries. Benvenuto Cellini, while walking one day along the street, ran into one of his friends, Benedetto, who began to dispute with him; Cellini immediately hurled at Benedetto's face stones which caused him to fall down at once. The adversary was wounded, but not gravely, being that he resumed his occupation the same day. The incident is recounted to the Pope. The Pontiff, who undoubtedly was in a bad mood at this moment, immediately ordered the Governor to arrest and hang Cellini at once and to not reappear before him until the execution had taken place. With Cellini having succeeded in escaping, the Pope himself, who earlier that morning wanted with no second thoughts to hang the great artist who had been to him most precious, declared that evening that “he would not wish to lose him for all the world.” All these men here obeyed their instinctive impulses with as little hesitation as that which a cat employs in springing itself upon a mouse who passes by within reach.

All the adventures that Benvenuto relates, and which are analogous, besides, to those that abound in the works of the era, permit us to form a very clear idea of the nature of the impulsive qualities of which I speak.

Society's most numerous class—the one which constitutes the crowd—forms another category of people who can be said to commit crimes due more or less to hereditary factors. Those individuals belonging to the crowd do not possess, in reality, any special criminal dispositions, but their character and morality are so weak and deficient that their conduct is absolutely dependent upon the circumstances. When the models of society are good or bad, the crowd will pursue these respective patterns of behavior: honesty in an honest environment, or viciousness in a wicked setting. It is only upon this category of possible criminals that education may have some impact. If it is necessary to give them a name, I would call them the neutrals.

To yet another category of criminals emanating from hereditary influences must be marshalled those individuals who are intelligent, energetic, and complete masters of themselves, but who are devoid of any ethical standards or possess perverse instincts. Most of them do not go as far as to commit crimes, or at least do not carry out crimes that are severely punished. Why? For fear of repression. Their morality has for limits the prescriptions of the Penal Code. Numerous are those belonging to this category, ranging from the shopkeeper who endangers the public health by falsifying his merchandise to the organizer of shady financial enterprises that ruin families. Of all the categories of criminals that I have enumerated, this one is the least affected by laws; it is, however, the most dangerous and least deserving of respect.

The second main classification of criminals that I have seen to establish comprises those individuals without hereditary inclinations towards leading a life of crime, but who have acquired brain damage; this category of criminals completely differs from all the preceding. The individual bestowed with the most honest hereditary disposition is just as exposed to becoming a criminal of this class as to finding himself a victim of cholera,

Instinctive sentiment and subsequent action are never separated by reflection. Whenever Cellini or a contemporary might encounter an enemy, he would hurl himself upon him in order to kill him, entirely like what ten hostile dogs in a small corner do in their leaping upon one another. Benvenuto chanced upon his rival Pompeo, the jeweler, outside an apothecary store; without saying a single word he mortally stabbed him twice with his dagger. Cellini assures us, though, that his intention was not to kill him; but, he added philosophically, “one is never sure of his blows.”

The following short adventure, which I found in the *Memoires* of the great artist and where he recounts as a matter-of-fact thing an act which today would land its author in court, is most instructive. While making his way back to Florence, Benvenuto Cellini arrived at an inn where the proprietor demanded, according to the custom of his premises, to be paid in advance. Cellini received a bed that he himself knew to be suitable and excellent, but he was so upset by having to pay in advance that he thought about setting fire to the house in order to avenge himself. Whereas modern man, accustomed to reflecting before acting, restricts himself to some words of displeasure, the impulsive man of olden times immediately resorts to the utmost extremities. “I did not sleep the entire night,” recalled Cellini, “because I kept on thinking about how I could obtain revenge. At one point I took up the fantasy of setting fire to the house, at another of slitting the throats of four fine horses that he kept in the stable. I saw that all this would be easy to carry out, but I did not see how it would be easy for me and my comrade to escape.” Checked in his designs of murder and arson, solely because of the difficulty in escaping afterwards, Benvenuto confined himself to slashing with a knife four new beds until he had done more than 50 crowns of damage. Violent impulses, poor reasoning, no morality at all: these are the qualities that we can further study today among an entire category of criminals. Such persons, one will find, are like infants, savages, and the majority of females, and are as fatally obedient to the impulse of the moment as the weathervane is submissive to the action of the wind.

smallpox, or a train accident. A harmful parasite wandering through the extent of the nervous system may beget lesions that transform the most virtuous man into a scoundrel capable of committing all crimes. This latter development usually manifests itself in the following manner. General paralysis appears first, while the person's reason still seems intact; under this particular form of malady, most notably epilepsy—a seemingly insignificant affliction, though most redoubtable from the point of view of producing intellectual deterioration, in which the epileptic, without showing any apparent outward signs of trouble, loses consciousness of the entire world for a short while—as well as many other kinds of injuries to the nervous system which it is not necessary to enumerate here¹, often have for consequences mental derangements which lead to all possible varieties of crime. The number of general paralytics convicted for indecent assaults, or epileptics guillotined for murder, is truly immense.

Far from diminishing with the progress of civilization, this class of criminals tends each day to become more and more numerous. In perhaps no other period of history have acquired lesions of the nervous system, lesions which might then be transmitted through heredity, been as frequently found in people as they are today. Physical and moral excitants of all sorts—tobacco, alcohol, excessive work, ambitiousness to succeed, overindulgence, etc.—have augmented in a disquieting way the number of individuals struck by affections of the nervous system. One can easily characterize our era as the *Age of the Excited*. At the time of the Crusades and during the entire Middle Ages, there was also present amongst the people an overexcitement of the nervous system; but this overexcitement, instead of impacting very different physical and mental functions, hardly expressed itself but upon one very limited category of ideas—religious ideas. This was the *Age of the Hallucinated*.

In order to reform criminals who have acquired damage to the nervous system, it is very important to note that it is not only lesions of the brain or spinal cord which can result in profound mental troubles and criminal acts; that which can attack the sensory organs may lead to identical results.

Also, although mental derangement is most often caused by the deterioration of nervous centers overburdened by the preservation or elaboration of sensory impressions, it frequently originates as well from the deterioration of the assemblage of sensory organs which receive these impressions. One sees individuals, having become deranged after losing their sight, recovering their sanity immediately following an operation that has restored their missing vision. Of 120 blind persons examined by Doctor Dumont, 37, that is to say nearly a third, exhibited mental disorders, ranging from hypochondria to mania, accompanied by hallucinations and madness. Injuries of the senses, such as touch, which in appearance ought to have little operation upon our thought processes, can also

¹ Among the numerous examples of an insurmountable bent towards committing criminal acts because of injuries to the nervous system, one of the strangest is the case of the Zouave wounded in the head during the Battle of Bazeilles and who, after his recovery, at certain moments fell into a peculiar state in which he would steal any sparkling object, even those without value, that offered itself to his eyes, and do so without at all trying to hide. His detailed history has been published by many journals of medicine.

become the origin of very serious mental disturbances. Doctor Auzouy has reported the curious history of a most intelligent young man of excellent character who, after receiving some anesthesia to his skin, became so unruly in his behavior that one was obliged to commit him to the Maréville asylum. A suitable treatment having restored the man's cutaneous feeling, his moral dispositions reappeared like they were at first. He repeatedly experienced afterwards many periods of insensibility of the skin, whose advent was immediately followed by the manifestation of those bad behaviors which had made him be put away.

The alteration of sensations due to an internal origin, that is to say of sensations impaired or altered by the principal vital organs, can also be the source of more or less profound mental perturbations. This is how, I believe, one can explain the frequent appearance of such disturbances of the intellect as alienation, which one observes among pregnant women, delirium, which one notices among infants possessing intestinal worms, and personality and mood changes, brought about in many individuals who have certain viscera—especially the liver, prostate, and urethra—that are damaged or diseased. Doctor Esquirol has reported the case of an individual suffering from an acute and raging mania caused by the presence of a tapeworm and who was immediately cured after undergoing an appropriate treatment that ridded him of his parasite. One year later, the fit of mania having reemerged, the same vermifuge treatment altogether freed him from the newly returned mania and its attacks. Brown-Séquard has cited the example of a 14-year-old child afflicted with delirium produced by a fragment of glass that had remained unnoticed in the victim's big toe for years. Whenever one squeezed the affected toe, the delirium increased; it completely disappeared when the piece of glass was extracted.

I shall examine later on from the social point of view—that is to say, from the exclusively practical point of view—the degree of responsibility that can be assigned to the different criminal classes I have highlighted. A theoretical examination would be entirely without interest, I suppose, for psychologists are perfectly convinced that man conducts himself according to his nature and according to the environment in which he operates. Nonetheless, I shall offer this thought. Assume that a criminal was able to act and behave in a different manner than his make-up allowed; this then is to admit by the same fact of this hypothesis to a nature whose circumstances differ from those that have been brought to bear on him, and consequently to change the series of antecedents that have engendered the crime. In order to imagine Saint Vincent de Paul cutting to pieces an old woman after having violated her, a nature totally different from that which this kindly and charitable man possessed must be supposed, that is to say, an individual entirely different from that which was Saint Vincent de Paul must be imagined. Lunatics or not, we are fatally committed to being good or evil with the same inevitability as the balance beam, with its two scales loaded with unequal weights, tilts towards the heaviest side.

I shall set aside these theoretical discussions, though, inasmuch as they mainly lend themselves to controversies that are of no interest here. Besides, whatever may be the opinion that one professes relative to free will, the conclusions that we shall soon formulate on criminals will prove to be quite unassailable. I only wish in this work to enter upon practical questions, and from this standpoint my grounds are much too firm for me to be worried about defending and maintaining my position. As we shall shortly see, all that which I have

expressed about the mental constitution of criminals does not at all imply the uselessness of repressing crimes. Such repression is, on the contrary, indispensable for all criminals, and above all for the previously-discussed most numerous class—the crowd—whose members' conduct is only checked by the fear of repression. For every citizen, whether one be a madman or sound of mind, repression of crime must exist; but with the progress of modern science the various means currently employed to control crime must be entirely transformed.

III

With the question of criminals having thus been treated from the medical and psychological point of view, we shall now turn our attention to studying it from the judicial and social point of view.

In theory there appears to be no distinction between these two points of view, because the law is theoretically made by and for society, but in practice it is entirely otherwise. Undoubtedly, the law is little more than the written down formula of public opinion, and corresponds well, at the time it is introduced, to the needs of society; but, conservative by nature, the law always retards public opinion. Now, because public opinion itself generally embraces pretty late the necessities that have engendered certain social transformations, what results is that laws that are at first totally adapted to and fit the needs of certain epochs subsequently become no longer suitable to the needs of certain others. Such laws reach their end then and are terminated upon their becoming highly detrimental, after having been originally very useful. The judicial interest and social interest, at first identical, afterwards separate and end up by contending with each other. In all ages it has been so, but most particularly in the periods of rapid progress, such as today.

Our present criminal code finds itself exactly in this place where the law is no longer in accord with the needs of the society that it is called upon to govern. The magistrate who judges by taking, as he must do, the law for his guide, judges with an interest that is no doubt in the interest of the law, but which is no longer that of society.

In order to clearly perceive the philosophical spirit of our current legal code relative to criminals, it is necessary to go back to its real roots and obtain an understanding of the series of its successive transformations. Concerning the history of this evolution, the books of classical law are utterly silent. Further back than the old Roman laws of the Twelve Tables, framed in 451-449 B.C., one finds nothing but the darkness of time. I certainly do not wish to recommence here a history that I have already outlined in the chapter devoted to “the evolution of the law” in my book *L'homme et les sociétés; leurs origines et leur histoire*; however, it is necessary for our objective that I retell in a few words that among all peoples the right to punish was at first the right pure and simple to vengeance, a right originally exercised by the offended party or his family and later on by society itself. In exercising vengeance the punishment of one-for-one retaliation—the eye for an eye kind of penalty the Bible and all the ancient codes prescribed—was substituted in after years by monetary compensation. In fact, the initial meaning of the word “punishment” in its original Greek or Latin (ποίνη, *pœna*) simply signifies “compensation.” Crime in

itself does not have to be disgraceful; it may merely cause damage. When vengeance is satisfied by a monetary settlement, the culpable person's lawful consideration generally ends the matter, as is the case today whenever the president of a railroad company indemnifies the victims of a train accident. Along these lines, in Anglo-Saxon law the life of each man as well as the mental or material damages that he might suffer were valued by an amount of silver that varied according to his rank.

Our modern notion about crime therefore does not exist in the early codes, at least as far as individuals are concerned; it only is evident with regards to offenses affecting the entire tribe or the gods of the tribe. In a more advanced form of evolution, people recognize that society is harmed more by certain offenses than by others, and that the murderer, robber, and arsonist are in reality the most dangerous criminals of all. Society then substituted itself for the individual in the pursuit of chastisement, extracting vengeance in the name of the community by means of monetary reparations or a pronounced punishment upon the offender, which necessarily affected the guilty party in his honor and consideration. Simple monetary compensation for the majority of acts that we categorize as crimes today has in the meantime persisted for a long time. At the fall of the Roman Empire, it had nearly disappeared from Latin law, but it reappeared in the Middle Ages with the invasion of peoples who were still at this phase of evolution concerning the ancient rights.

This old-fashioned notion of vengeance under any sort (retaliation or compensation) which at first was exercised by the offended party, then later on by the community, has been substituted in modern times by the idea that laws are not instituted for avenging society, but for protecting it by punishing culprits, and to curb the tendency towards crime by the example of various punitive measures.

If the modern codes were truly written according to, and under the influence of, these latter principles, they would probably have to be perfect; but, what becomes clear in an attentive reading of them and in an examination of the conditions to which they are applied is much more the old notion of vengeance than that of protection, and in reality the second is almost entirely sacrificed to the first. It has come to the point where, in order to satisfy this hidden need for vengeance, we have found recourse in a system of punishments that renders the convicted person considerably more dangerous than he had been initially, as is substantiated by the continual increase in the degree of recidivism. Two of the theoretical goals cited above—protecting society and correcting the offenders—are therefore not being attained. Only the third—frightening people by the threat of punishment—has perhaps in a certain measure been achieved, but in every case it has proven to be a very weak measure.

Such is the actual state of criminal law from the judicial point of view. We shall now evaluate the question of criminals from the social point of view.

IV

We must first of all remark that we can consider as an evident truth that from

the point of view of the social interest it is of little import that the “public outcry,” as the jurists call it, be satisfied, but that it is much more important that society be protected. Is it in reality being protected? We shall investigate this.

In order to understand how our current legal code protects society against criminals, we shall invoke the authority of those persons who are the most interested in defending it, meaning the magistrates themselves. From their declarations as well as from the results of statistical studies, what becomes clearly evident to us is that today's prison—this principal sanction of modern law—is an excessively costly establishment, uniquely serving to handle well the most dangerous, that is to say, those who are not individuals entering it for just a short time. “Where there is a prison,” wrote a few years ago Monsieur Moreau Christophe, Inspector General of prisons, “there is an association to such a degree that, with the hand of justice covering so to speak the entire country with an immense net in which each hole in the mesh is a prison, it follows that our 3 convict prisons, 20 central prisons, 362 jailhouses, combined with the municipal jails of our 2800 cantons and the secured rooms in our 2238 police stations, are as much as anything antisocial clubs and dens of malefactors hosting public reunions of the condemned, accused, vagabond beggars, murderers, robbers, and prostitutes, all of whom are associated with one another by their bonds to the fellowship of crime.”

At the present time we lock up each year more than 100,000 individuals.¹ They emerge from the prisons without any other possible occupation but to conspire against society, propagating their vices and corrupting through their fatal example those with whom they associate. “If, in taking a period of ten years,” wrote Monsieur Beranger, presiding judge of France's highest Court of Appeal, “one adds up the number of detainees who every year have succeeded each other in our jails and prisons, one will find that more than a million inmates are plunging ever deeper into a life of crime, and that the cost to the State to maintain them is upwards of one hundred thirty million francs.”

Since these lines have been written, nothing has arisen to modify this legitimate concern. The number of individuals incarcerated has become very great, and the amount of money that imprisonment now costs has nearly doubled. As for repeat offenders, they are crossbreeding rapidly, as the following table demonstrates:

Number of Repeat Offenders Sentenced by the Criminal Courts and Correctional Tribunals in France

<u>Years</u>	<u>Number of Repeat Offenders Sentenced</u>
1872	59,076
1873	63,469
1874	70,806
1875	69,809
1876	70,257
1877	72,733

¹ In 1877, 105,123 persons were sentenced to jail by the petty crime courts, and about 3500 were sentenced by the criminal courts to prison, solitary confinement, or death; around 1000 were sent to convict prison.

In six years the repeat offenders have, as one can see, increased by 13,657. Two thirds of these recidivists (46,627 in 1877) had originally been sentenced for only a year or less of confinement.

At the same time as the repeat offenders have multiplied and as, under the influence of humanitarian ideas, the sole punishment truly feared by certain criminals—the death penalty—is more and more rarely applied, the number of major crimes is rapidly increasing. The following figures, also taken from official sources, furnish the categorical proof:

Number of Major Crimes (Homicides, etc.) Against Persons

<u>Years</u>	<u>Number of</u> <u>Defendants Convicted</u>	<u>Capital Punishments</u> <u>Performed</u>
1872	1,884	26
1873	1,954	15
1874	1,972	13
1875	2,023	12
1876	2,101	8

I shall not lay stress too much upon the serious implications that are conveyed by these totals; but is it not remarkable that, as capital punishment has become more rare, the number of major crimes has increased? Is it not evident that this constitutes a powerful argument against the death penalty's suppression?

A learned economist, Monsieur de Molinari, recently made instructive calculations about the odds of incurring death to which one exposes himself in regularly practicing the trade of murder versus certain other dangerous professions, like being a mineworker. Taking into consideration the number of crimes committed annually and comparing this number to the odds of dying in certain trades, such as mining, and noticing as well in both the English and Belgian statistics, the only ones published, that the perpetrators of *three fourths* of the crimes designated as such by law enforcement authorities remain unknown, that only one criminal out of every six is able to be arrested and punished, that out of 36 murderers there is on average only one guillotined, Monsieur de Molinari arrives to this conclusion: being in the murder trade is much less perilous than working as a miner, and “that an insurance company which would insure murderers and mineworkers would require from the former a lower premium than what it would be obliged to demand from the latter.”

From all that has preceded, the influence, or lack thereof, can be plainly seen. When society avenges itself from the offense committed by a criminal by locking him up, this childish remedy is its right; however, society must not at the same time forget that it pays for this vengeance very dearly, and that upon completing his sentence the criminal, who often only weakly fears for his being sent to prison, will always emerge from it a much more

dangerous person. In fact, major crimes nearly always have for their authors individuals who have experienced the injustice of being previously imprisoned for minor infractions.

That prisons might be able to ameliorate a criminal, this is one of these ideas that cannot find defenders today amongst competent persons. I readily admit, from the theoretical point of view, that by radically transforming our prisons, making them no longer prisons per se, they might be able to have a useful action upon that category of neutral natures whose mental constitution I described earlier; but this transformation is only possible at the cost of such an expenditure of work and effort that one will not find anyone willing to burden himself with such toil. From the practical point of view, the theoretical possibility of this amelioration is therefore without value. Nothing is easier to prove theoretically—mind you, only theoretically—than the possibility of the amelioration of a particular category of criminals. The neutral and indecisive characters about which I have spoken perform indifferently good or evil in conformance with the influences acting upon them, and will consequently conduct themselves well if one places them under the influence of goodness-oriented incentives that are more powerful than other kinds of incentives which might contrariwise attract them towards wrong-doing. It is by the employment of these means that some have succeeded in a few famous experiments to bring about improvement in a certain number of detainees. Such are the experiences of Governor Obermann regarding 600 prisoners in Munich, of Captain Maconochie at Norfolk Island, and of Colonel Montesinos at Valencia. Although trumpeted as a complete success, such attempts have not been repeated and are hardly even possible to carry out. Transforming the prison—this principal end point for society's vilest dregs—into a schoolhouse, supplying to the individual who would sojourn there all that in which he is deficient, is, I must say, most certainly one of those works of which perhaps none other is greater or merits more our admiration and gratitude; but at the same time it is one of those works that can only succeed if it is carried out by men endowed with the greatest character and highest intelligence, by men undertaking this job with complete devotion and an unshakeable belief in its worthiness. However, can one truly hope to find such qualities in the quite subaltern natures that we place in charge of our prisons, men whose powers moreover are narrowly limited by the regulations of a meticulous and harassing bureaucracy?

The above rare experiments that I have cited in order to place before the eyes of the reader all the elements of the question are therefore unable to prevail against the following definite fact, a fact which is understood by the magistrates themselves, and is also verified by statistics: that our penitentiary system, far from protecting society, only accomplishes to create for it an army of enemies. This army is rapidly increasing in size, and we can already foresee the day where modern civilizations will not manage to come apart and collapse but at the cost of some of those gigantic hecatombs which make history shudder.

The consequences of our criminal code then are absolutely disastrous; and yet, for the sake of arriving at such results, society places in charge of legal proceedings a category of individuals who are unfortunately far from being able to be considered as the most enlightened, and whose cold ferocity entirely reminds one of the darkest

days of the Spanish Inquisition. Today the law treats our lowest citizens in the meanest and most limiting way, while at the same time the most obscure of our magistrates can harass the most eminent citizens.

Dangerous for most honest citizens, corrupting to the neutral natures (whereas another system would be for them ameliorating), and fatal for society, against which it arms more and more numerous legions of bandits who threaten to submerge it some day: such is our current criminal law.

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We have come to see what our criminal law is and what it has produced; we shall now see what it might be able to be, and certainly what it will be one day.

With the pressing necessity for society to protect itself against the destructive elements contained within its midst having been clearly acknowledged, and the impossibility of changing criminals for the better by the means presently in use having been likewise demonstrated, we find ourselves strongly drawn to this severe conclusion: society must at all costs eliminate from its midst those posing the most danger to it. The way to attain this result without wounding our sentiments of humanity is in reality very simple. It will suffice to deport all the criminals to one of those distant countries in Africa, Oceania, etc. that civilization has not yet touched. I am convinced that the legislator of the future, fathoming the laws of heredity, knowing that most of the habitues of prisons and jails are individuals possessing a peculiar mental constitution which has either been furnished them at birth or has resulted from a pathological state whose causes we can do nothing about, will set aside vain discussions about the degree of responsibility of criminals; and, remembering that the primary duty of any society is to defend itself, he will close forever the prisons and jails, deciding instead to reallocate and spend the multimillions that they have cost to deport to the far-off countries for life all the recidivists—they and their posterity—in every case involving serious wrongdoing. Deportation to the semisavage countries will, moreover, clearly place most of the criminals in a setting that corresponds well to their twisted intelligence and inferior morals, and they themselves might even prosper there.

As for minor violations of the law that hardly endanger public security, monetary fines or, in their absence, obligatory industrial or agricultural labor for a variable duration of time, or also even military service performed under strict discipline, will prove much more efficacious than prison. Such means will above all be effective with regard to those offenders so little punished nowadays—commercial and financial swindlers—who so profoundly demoralize all modern nations, and who, though less noxious in appearance than masked highwaymen, are nevertheless a much greater evil.

As for the genuinely insane, it is necessary to resolve to put them away forever, because they are generally incurable and are considerably more dangerous in reality than the sensible man who, under the influence of a transitory violent passion, commits a crime. To acquit and set at liberty an individual who methodically kills his wife with

an ax, as was recently done by a jury under the pretext that the murderer, being drunk, was irresponsible, this is to reinject into society a person just as dangerous as an enraged animal.

Even from the humanitarian point of view, which in this case must only be considered of secondary importance, the system of deportation will prove to be significantly less cruel than the punishments that we inflict today upon those found guilty of a crime, punishments which render these people incapable afterwards of ever finding any work.

Questions of responsibility or of free will clearly have little to do with all that has preceded, and if we notice that judges always appear anxious, it is but an unconscious mien due to their being under the preoccupation (emanating from the ancient right) not of protecting society, but of avenging it. Where the injury occurs through accidental or involuntary means, it's as if it basically does not exist, and vengeance loses its applicability and rights; from this arises the importance for judges of knowing whether the crime has been committed intentionally or not.

In reality, such preoccupations are silly. Should a snake or a mad dog bite me, I care little about knowing whether the creature is responsible or not for its misdeed. Instead, I try to protect myself and others by preventing it from wreaking further harm: that is my sole preoccupation. Most certainly, all criminals are irresponsible, in the sense that by their nature or life circumstances they could only be criminals; but, should these redoubtable beings deserve more consideration than the thousands of innocents that we send to perish miserably upon distant fields of battle in order to defend the honor of causes which they themselves do not understand? Should a murderer's victim and, above all, the future victims that will surely be so upon the killer's release from prison or the hospital be themselves less worthy of concern than this murderer himself?

The moralists, accustomed to believing that a benevolent Providence governs the world with an equitable hand, and that their idealized vision of justice should lord over matters, are unquestionably indignant that an individual may be punished for a mistake for which he is not at fault. But these righteous men, who have only lived their lives inside books, always overlook anything that is not in agreement between their reveries and the reality of things. It is surely not my fault if I light upon in my path the obscure microbe for smallpox, cholera, or the plague; and yet, if I do encounter it, I shall be punished and likely die. Moreover, it is not any more the fault of an individual if he is good or wicked than if he is handsome or ugly, intelligent or stupid, in good health or sick. Nothing, however, prevents a person from being in these different cases rewarded or punished by nature or by mankind, for qualities or vices as independent from his will as the color of his eyes or the shape of his nose. We may feel sorry for those who in share possess low intelligence, physical ugliness or a feeble state of health, just as we feel sorry for the insect that we squish while walking or the animal that we send to the slaughterhouse; but this here is a vain compassion which cannot extricate them from their destiny.

Our conclusion therefore is clear: All criminals without exception are responsible, and society is obligated to protect itself against them. Such a doctrine surely does not

have any chance of winning many adherents today, and one may only consider it as a verity of the future, a truth that will be commonly held fifty years from now. With such previsions must we suffice ourselves; for the knowledge which permits the observer to foresee the transformation of ideas that must inevitably bring about the evolution of a civilization does not supply him any means of accelerating the course.

“The Skulls of Malefactors”

by **Doctor Léon Ardouin**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of July 17, 1879

Messieurs, in my capacity as a Physician (1st Class) in the Navy, I have been able to take measurements on the skulls of a number of convicts executed in 1849 at Rochefort Prison. Today I shall share with you my findings. Now, the convicts whose skulls I measured were: sixteen murderers, four robbers, four rapists, a poisoner, and one sort of evildoing hydrocephalous and idiot madman.

In general, the results I obtained coincide with those pertaining to murderers that Doctor Bordier presented to the Society at our April 17th meeting last Spring. In my study I used mustard seed to cube the convicts' skulls, and like Doctor Bordier I found the murderers possessing a considerable cranial capacity. Here now are the results I obtained:

Cranial capacity (cubic centimeters)

The murderers	1654
The robbers	1627
The rapists	1593

The other measurements that I took on these skulls differed from the usual averages in the same way the measurements of Doctor Bordier indicated.

Here are some additional measurements I obtained, which I have placed in a table that compares them to those taken by Doctor Bordier and to ones obtained from skulls of the West Cemetery.

	West Cemetery	Bordier	Ardouin
Subcerebral region	1.8	2.63	1.90
Frontal region	11.09	9.9	9.70
Parietal region	12.7	12.7	12.50
Occipital region	11.9	11.7	11.90

As you can see, the subcerebral region, which Doctor Bordier has observed to be strongly developed in murderers, is notably less considerable in the more mixed society that I studied; nevertheless, even in the convicts whose skulls I measured, it is rather more elevated than the average. My findings do, however, coincide with Doctor Bordier's with regard to the development of the frontal region, which both of us found to be much

more weakly developed than in the average person. By contrast, the parietal and occipital regions deviate little from the average.

Finally, by utilizing the profile-taking instrument Doctor Le Bon invented and described to us last year, I have been able to make accurate drawings of the profile of each skull I measured. These drawings, messieurs, are available for your review, along with the biography of several of this study's scoundrels.

The last 1879 meetings of the Society that impress themselves in my mind occurred in October; four worthy papers from these sessions I have enclosed, and two especially elicit cherished memories. The first relates to what happened on October 9th. On that day Le Bon showed the Society photographs that he had taken of the Nubians at the Jardin d'Acclimatation. I must say the pictures came out remarkably well; the necessary still poses were obtained, no doubt due to skillful efforts on the part of the master and the keepers.

In any event, Le Bon's photographs provoked the following controversy. Doctor Broca claimed that they offered evidence to his contention that Negroid qualities (that is, long forearms, short upper arms, most particularly) are manifested in both Egyptian and Greek statuary. This contention, which our Society's great founder went to some trouble to support, saw itself thoroughly refuted two weeks later by the famed sculptor, Emile Soldi, at the October 23rd meeting. Soldi's talk on "The Proportions of Greek and Egyptian Statues" was one of the most extraordinary I ever heard. The sculptor, being an author of several scholarly art books, came at the membership from an angle that we were definitely not used to; largely disdaining the realm of anthropology, Soldi employed arguments and fresh perspectives derived from his field of expertise—the arts—to make his case. And how convincing he was! In fact, I had never seen Broca so taken aback and put on the defensive as in this instance. The final blow dealt by Soldi, clinching the victory for him, was his concluding assessment, which I trust you will find devastatingly brilliant and accurate, to which there was no comeback (wisely so) from any of the members: "I therefore believe, messieurs, that in science one must above all interest himself more in uncovering and highlighting the dissemblances rather than the resemblances, because the

latter can always be detected, which, while being conducive to all theories, do not really provide a serious basis to any."

“The Nubians of the Jardin d'Acclimatation”

by **Doctor Gustave Le Bon**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of October 9, 1879

Messieurs, it is my honor to place before the eyes of the Society photographs that I have taken and which show the Nubians of the Jardin d'Acclimatation.

These photographs present the Nubians in diverse poses. In order to indicate the scale of proportion, one can place on these pictures a strip of paper one decimeter in length, which permits one to determine the scale to which each photograph has been made. Among these photographs there is one which has especially attracted my attention. It depicts a naked Nubian, and looks like the drawing known under the name of Canon of Lepsius. This drawing was discovered on an Egyptian tomb, and is marked by crossed lines as if one had desired to note the dimensions of the body. It is remarkable that this particular drawing corresponds so closely to the photograph of our Nubian.

DISCUSSION

Doctor PAUL BROCA. I had occasion last year (see the *Bulletins* for 1878, page 305) to point out to the Society this singular fact: that the proportions found in classical Greek sculpture, mainly those concerning the limbs, appear to have been borrowed from the Ethiopian type. We know that the antibrachial index of Negroes is substantially greater than our own, this being so on the one hand from the elongation of their forearms and, on the other hand and above all, by the shortness of their upper arms, for their humerus is not only much shorter with respect to their radius, but also with respect to their femur and tibia. I must remind you of how Professor Fock, fancying to redo the missing broken-off arms of the *Apollo of the Belvedere*, attempted to procure a skeleton that conformed to the proportions seen in Greek statuary; after making a large photograph of the restored statue, he began sketching the outlines of skeletons over this photograph, and was unable to find any European skeleton that presented the same proportions. Monsieur Vasseur, who has addressed himself to this effect, advised me—and I can verify—that the proportions of the limbs of the skeleton sketched over the photograph were those of a Negro. This situation exists not just on the *Apollo of the Belvedere*, but also one can make this same observation with respect to many other art works of antiquity. In searching for the explanation of this fact, I recall that Diodorus of Sicily, at the end of his first book, recounts by means of a legend that he supports that the rules applicable to Greek statuary had been imported from Egypt. I have therefore been led to suppose that the Ethiopian qualities of Greek sculptural works have been borrowed from corresponding Egyptian works.

The Negroid proportions found in Egyptian statuary can be easily accounted for once

one understands the prudish views of the Orientals. Although very libidinous in many of their acts, they regard it as contrary to their dignity to appear naked for examination or image reproduction purposes. Even today it is extremely difficult for them to decide to allow themselves to be seen or photographed without any clothing on. Therefore it was very probably slaves, that is to say, Negroes, that the sculptors of ancient Egypt had posing before them. And given that men back then believed (and still did, up to the beginning of this century) that people of all races possessed the same bodily dimensions, and only differed in color, one did not hesitate to assign to a white person the same proportions that one had only measured on the Negro.

Your photograph, Doctor Le Bon, provides additional confirmation of this point of mine, and for this reason seems to me worthy of attention.

Monsieur GAULTIER DE CLAUBRY. I must point out, Doctor Broca, that the *Apollo of the Belvedere*, so admirable that it is, dates from a relatively recent epoch, and other statues of similar age often display its elongated nature. This same remark is applicable to the *Gladiator*. These two statues cannot be regarded as types of ancient statuary, and, in fact, it would be of much greater value to study, for example, the *Achilles* at the Louvre.

Doctor PAUL BROCA. Monsieur de Claubry, my research was not conducted just on the *Apollo of the Belvedere*, but also was performed on a series of ancient statues, as well as on some engravings and paintings from Pompeii that I had photographed. I was especially able to measure from a painting the proportions of a Pompeian woman the instant that she threw a veil over the skeleton of her son. This particular painting is also interesting from another point of view. It is said that the ancients did not understand well the human skeleton, and Galen has been cited as having occasion, not by possessing one, but to study one from a hanging. However, the painting that I've just referred to depicts a skeleton exactly.

All these statues and drawings, whether examined from the original or from their photographs, have led me to the same conclusion. It is true, though, that I have mainly applied myself to investigating the proportions of the upper limb.

“On a Relatively Light-skinned African Tribe”

by **Abbé Durand**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of October 23, 1879

I shall be brief today, messieurs, in my remarks, which pertain to a puzzle that has interested me greatly. During the 15th and 16th Century, the Portuguese performed voyages from one shore to the other in Africa. In 1562 Lopez pointed out the existence of a relatively light-skinned tribe located near Loango in the western Congo; this tribe engaged in the gold and ivory trade, and also competed successfully with the Arab slave-dealers.

Nowadays, this tribe is said to be in Mozambique. For three centuries it has been driven in a rotary motion, and now finds itself on the eastern side of the African continent.

You might wonder how a light-skinned tribe can be encountered in central Africa. I believe I have perhaps found an answer to this question. Albuquerque, the Portuguese explorer, related that millions of Indians from the Brazilian region had, in fact, been sold to Lisbon and were transported to the coast of Africa. These Indians originated from the areas around the Amazon. Therefore the hypothesis that this bronzed and relatively light-skinned tribe is a remnant of these exported Indians seems quite plausible. Hence, we see from the time of Lopez this errant tribe in the African continent searching for a home that it does not appear yet to have found.

DISCUSSION

Doctor ERNEST HAMY. I do not believe that there is any need to go as far as Brazil in order to explain the presence of certain relatively light-skinned tribes inhabiting various parts of central Africa. I have questioned Monsieur Serpa Pinto about the qualities of the Negroes possessing yellowish skin that he has observed, and I have come to believe that these Kassikers, as this journeyer called the white Negroes, are none other than the veritable Bushmen.

The Haw-Koîns of Damaraland, situated only a few degrees south of the region where the *Kassikers* live, are pure Bushmen.

Doctor PAUL BROCA. I must say that there is some doubt in my mind about the very existence of these so-called white Negroes.

Abbé DURAND. For your information, Doctor Hamy, Monsieur Serpa Pinto has, in fact, been sharply criticized by the Geographic Society of Lisbon; in particular, they charged that his alleged discoveries had been previously made, and that the corresponding facts resulting therewith were already known.

“The Aryan Homeland”

by **Henri Martin**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of October 23, 1879

I wish to present to the Society some observations with respect to the recent work of our learned colleagues, Doctor Piétrement and Doctor Lagneau. I have been struck by Doctor Piétrement's viewpoints concerning the localization of the Aryan homeland, that is to say, the primordial cradle of the Aryans, and am inclined to make room for his conclusions; however, due to my lack of sufficient competence in this area, I shall not focus on this point today.

I had doubts about another conclusion reached by Doctor Piétrement—that brunet Aryans preceded those with blond hair—and that such brunets had been Aryans from the earliest times; but, the recent research of Monsieur de Ujfalvy appears to tip the balance in favor of this opinion. Brunet brachycephalic Aryans therefore seem to have formed the initial composition of the populations inhabiting the original Aryan homeland, and then some time later, blond dolichocephalics, who from all appearances were the Aryans' neighbors to the west (towards the Caspian), intermixed with them.

From these brunet Aryans of central Asia were sprung the brunet brachycephalics of Old Europe, among which Monsieur de Ujfalvy finds again the type of their ancestral brothers of Asia.

Now, I must take exception to the opinion of Doctor Piétrement, who thinks that the brunet Aryans had invaded and dominated Europe, while the blond Aryans had only obtained equality with them posteriorly. We indeed see that in India the blond race had been considered inferior. However, in Europe it was just the opposite, and, in fact, all the traditions find themselves in accord with this. The Aryans, or Aryan-like blond dolichocephalics, came into ancient Europe well after the original inhabitants, and drove off or subjugated the brunet brachycephalics. This process occurred all the way from Greece to Ireland, and even outside of Europe, throughout North Africa as well. The Celtic conquerors of Ireland were blonds; the Hellenes and Thracians, dominators of the Pelasgians, were blonds; blond Libyans enjoyed preponderance in Africa. These blonds of ancient times are in the West the dolichocephalic builders of the dolmens. So, I maintain that in the West, taking into account the findings of Monsieur de Ujfalvy and Doctor Piétrement, the domineering blonds were descended from the Aryans, and the more or less brunet brachycephalics were of Celtic origin.

There remains one notable difficulty: this is the great difference which is evident between the type of brunet Aryans I've already discussed and those other brunet Aryans, most illustrious in history, who came down from central Asia into India and Persia.

One might well be able to identify some analogy between the Indo-Persians and certain exceptionally elegant and fine types of southern Europe; but, our brunet brachycephalics, of which the Ligurians comprise the most characteristic branch (and, if one insists, our inland Bretons as well), certainly do not resemble at all the Indo-Persians. It is quite likely that to these latter we can attribute, with their departure for the south, the first flight of the Aryan language and society.

Now, unlike Doctor Piétrement and Doctor Lagneau, I believe that it is entirely inadmissible to categorize the blond race in Europe as Germanic. The Germans or, to use a more ethnic term, the Teutons, are only an assemblage of this blond race; one does not begin to perceive the first swarms of them in western Europe until around the third century B.C. This term, in fact, ought to be renounced, as all it does is completely muddle up the ethnography of Old Europe. This is why for quite some time linguists have renounced the term *Indo-Germanic languages*, which possesses the same drawbacks for linguistics. Even the term *Cimbris*, which we willingly employ now, while preferable to that of the Germans in the sense that the Cimmerians had by far preceded the Germans in the West, is not yet itself sufficient; this is because other blonds had come into western Europe long before the Cimbris or Cimmerians. These dolichocephalics of the dolmens intermixed with and dominated the brunet numerical majority inhabiting Gaul, the British isles, Spain, and Italy, and brought the Celtic language into the West.

To this observation I must attach another. This is that the overwhelming majority of the Belgae, in the time of Caesar, were Gallic, spoke the Celtic language, and were not Germans, even though they had originally come from the Outer Rhine region that just a little before the Christian era had begun to be called Germany. They had come in *antiquitus*, said Caesar, which is incompatible with a Germanic origin, given the fairly recent arrival of the Germans. As for the Galatians of Asia, they were incontestably en masse Gauls and not Germans, and were absolutely identical to those Gauls who seized Rome; however, some Germans, the first ones mentioned in history, had begun to intermix with them, in the same way that much later one saw contingents of several Germanic tribes, 40,000 men out of 300,000, blended into the large Gallic-Belgic army which fought Caesar. Along these lines, Saint Jerome said that the identical nature of the language spoken by the Galatians with that of the people of Trier proves that many western Europeans of that era, along with the great mass of the Belgae, were Celtic speakers. All the historical Belgic names that the *Commentaries* of Caesar and the Gallic coins furnish us are Celtic names, as are those in other parts of Gaul.

My next remarks principally address themselves to the interesting and scholarly research of Doctor Lagneau pertaining to the ethnographic map of France. I have discussed the Belgae; there is also something to point out about the Bretons. It is not admissible that the blue-eyed blond or chestnut-haired inhabitants of the coastal region of Brittany descended en masse from the fifteenth and sixteenth century immigrants from Great Britain. The Bretons living overseas were not taller nor any more blond than the Armoricans of Brittany; they were, like the Armoricans, a composition of diverse types, much like the mixture of peoples one sees in Wales. Additionally, the ancients tell us

that the Bretons were less blond than the Gauls.

As for the alleged Saxon origin of the inhabitants of the burg of Batz and the surrounding villages, not only has it not been proven, messieurs, but just the opposite is demonstrated by examining this population. For one, these people are the last in upper Brittany that have preserved up to now the Celtic language. Also, while their fine bodily type is blond, it has no resemblance to the physiognomy of the Anglo-Saxons. In fact, no vestiges remain of the Saxons along the banks of the Loire, whereas, on the other hand, quite interesting vestiges have been bequeathed on the topographical nomenclature of Picardy's littoral region, as is verified by the maps being prepared by the committee mapping the Gauls. These same maps will also probably provide the solution to the question concerning the origin of the Flemish. It appears to me that Monsieur Longnon is succeeding in establishing that those Flemish who speak in the Teutonic tongue originate from an immigration of Swedes and not of Saxons.

With respect to the blonds anterior to the Germans, I recently travelled through one of the cantons of ancient Sequania, specifically the Lomont region of the arrondissement of Montbéliard. Unlike in the greater part of Sequania, it is not the brunet brachycephalic race that dominates here; rather, it is the blond or chestnut-haired race that comprises the majority of the inhabitants, and there is not anything Germanic about their physiognomies nor do they denote in any way a Burgundian origin.

I can sum up my observations this way: all our blond Aryans or Aryan-like inhabitants in Europe originate from the same stock, but there are serious drawbacks in conferring on the mass of this race the name of its most recent branch, the Germans.

One point on which I am completely in accord with Doctor Lagneau is the identification of the Galatians, Cimbris, and Cimmerians; I associate the early Bretons with them as well, who in Gaul had preceded the warlike Gallic tribes from the Danube.

I must add that it will be very important to obtain from English scientists, who have more occasions than us to study the races of India, data respecting the dominant type among the Hindu Aryans. Even today we still do not know if the majority of them are brachycephalics or dolichocephalics.

DISCUSSION

Monsieur GIRARD DE RIALLE. At the time of our Society's earlier discussion about the origin of the Aryans, I responded to Doctor Piétrement by making a point that I regard as having preserved all its value. My reasoning dwelt upon this fact—that our colleague's position is reliant upon the Zend texts, writings that only pertain to the Iranian civilization.

Monsieur CHARLES DE UJFALVY. Messieurs, permit me to present to you a few thoughts on the subject of the Iranians of central Asia, whom Monsieur Martin mentioned in his stimulating talk.

At our next meeting I shall have the honor of offering you a monograph entitled: *Résultats anthropologiques d'un voyage en Asia centrale*. In this work I note that the Iranians of central Asia inhabiting the upper Oxus (the Galchas and Karategins constituting the purest type) are very brachycephalic, brunet, and of average height. It is in this manner that we encounter them in the center of their present-day habitat in the upper Zarafshan Valley (Galchas), Nouksou Valley (Karategins), etc. The farther we go away from this center, the more this type becomes altered; the height increases, brachycephalism lessens, and blonds are more frequent.

The following averages are therefore what we find amongst the peoples of this region:

	Cephalic Index	Blonds	Height (in meters)
Galchas	85.00	8.62%	1.668
Tajiks of the Ferghana	84.35	12.90%	1.709
Tajiks of Samarkand	81.26	27.58%	1.701

We see much the same proportions among the Uzbeks, who have lived with these Tajiks for centuries.

	Cephalic Index	Blonds	Height (in meters)
Uzbeks of the Ferghana	83.92	3.33%	1.684
Uzbeks of Samarkand	83.13	7.18%	1.675

It seems to follow that these populations intermixed themselves at a given moment long ago with a tribe composed of tall, blond people who were perhaps dolichocephalic. This intermixing occurred with much more intensity with the Iranians dwelling on the plain than with those living in the mountains.

There are a few more remarks I would like to make. The Aryans have certainly at some time in the past inhabited central Asia and the region of the upper Oxus. Did they come from Europe? Had they originated from Bactria? I shall refrain from rendering a verdict on such a ticklish question. However, messieurs, I will direct your attention to a work by Monsieur Poesche, entitled *Die Arier*, in which this author places the first homeland of the Aryans in Europe, as do several of you; he also fixes the exact location of this homeland, which according to him is Lithuania. Monsieur Poesche goes even further; he maintains that the Aryans—tall, blond dolichocephalics—are not a pure race, but instead are simply albinos. “In Lithuania,” he says, “everything in nature bears obvious traces of albinism. The animals are for the most part white, the foliage on the trees faded, etc.” This opinion seems to me absolutely unsustainable.

No doubt the various discussions our Society has had concerning the Aryans—discussions provoked by Messieurs Martin, Topinard, Hovelacque, and others—have not found favor with our counterparts in northern Germany. In their opinion, which is an absolutely immutable belief of theirs, the Aryan is tall, blond, and dolichocephalic. That is to say, the German is the most pure representation in Europe of the ancient Aryan race.

Setting aside the fact that the German is by no means as dolichocephalic, blond, or tall as these messieurs contend, one ought not to forget, moreover, that we absolutely do not know if the ancient language of the Aryans had originally been spoken sooner by the tall blond dolichocephalics than by the short brunet brachycephalics. I believe that we will never be able to scientifically answer this question. Also, it seems possible that the short brunet brachycephalics had given their language to the tall blond dolichocephalics.

Madame CLÉMENTCE ROYER. Monsieur Martin, what text or study have you relied upon in asserting the recent arrival of the Germans on the Rhine? If the Germans are recently arriving to this river, from where did they come? Can you provide us some facts about their previous sojourn?

Monsieur HENRI MARTIN. The only people called Germans are those endowed with the anthropological characteristics of this race, and as I stated earlier, Madame Royer, history does not mention them before the third century B.C. Now, at this point in time two German chiefs are cited as having accompanied the Galatians with the expedition proceeding from Galatia, where these Germans had previously made their residence.

Doctor ARTHUR BORDIER. I see that it is now 6 o'clock. As Secretary, I believe it is time to conclude this meeting. Thank you, messieurs and Madame Royer, for your attendance today.

“The Proportions of Greek and Egyptian Statues”

by Emile Soldi

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of October 23, 1879

Messieurs, today I would like to share with you some observations contained in my latest book, *L'Art égyptien d'après les dernières découvertes*. This work of mine draws from several different artbooks that are of great importance from the point of view of ethnography. In particular, I wish to talk about the bas-reliefs of the Second Dynasty in Egypt.

Regrettably, I have not been able to attend the meetings of the Society for a long time. However, in reading in our journal about the proceedings of a previous meeting, it is my understanding that Greek sculpture had been discussed which, according to Doctor Broca and other speakers before the Society, could have used the black race as its model, like that which is visible in the Apollo of the Belvedere; additionally, these same speakers contended that this model had probably been imported from the Egyptians and formed part of the Egyptian canon of sculpture. I am sorry to say that I do not share the opinion of our colleagues; I cannot at all admit that the Greeks would have taken as their ideal something other than their own model, nor would they have allowed the Egyptians to impose upon them what sculptural proportions to employ. In my book, on page 37 to be precise, I discuss at length this question of whether the black race's proportions are incorporated into the Egyptian canon, and assert their nonexistence in Egyptian sculpture itself.

Already in another book of mine entitled *La Sculpture égyptienne*, I have addressed this question. It is true that some people claim that in Egyptian sculpture the middle finger, serving as a guide, will measure one nineteenth of the height of the figure represented. But unfortunately, in the bas-relief that they cite as an example, except for the colossal statues of the pharaohs, the figures appear not to reach the termination point of the marked out nineteenth part. Some have explained this anomaly by saying that “the first archetype, like that which emerges from the hands of God, was an image of supreme perfection that no individual could ever attain.” This is, in my opinion, the kind of subtle distinction that one ought to avoid in all discussions on art. Besides, regarding the divisions denoted on this bas-relief, which become effaced at its edge, there is nothing to conclusively indicate that the portrayed figures do not reach the nineteenth division. And, it is natural to see in these divisions the process of squaring up a drawing, a method which still serves us today.

For sure the existence of models in Egyptian sculpture, which I talk about in *L'Art égyptien*, has also been recently discussed in the *Gazette des Beaux-Arts*; however, notwithstanding the *Gazette's* comments, what I shall now tell you, messieurs, is nonetheless an absolute certainty: we are talking here not about a case of unfinished sculptures, but

rather one where these bas-reliefs are always duplicated, the first being roughed out, while the second is very finished, upon which are traced the lines squaring up the drawing that constitute the so-called Egyptian canon. I have seen a great many of these in the British Museum, and in my book I carefully describe those observed by Boulac. I must point out that in a print of one of these reliefs (this print, incidentally, belonging to our colleague, Monsieur Geslin), the roughed out shape on the plaster or stone tends to be made up of longitudinal cuttings issuing from bottom to top, which necessarily instill a very elongated character to sculptures created in this manner; and this shows how important it is for the ethnographer to pay close attention to questions relating to sculptural techniques, as these can so greatly modify the shape of the depicted individual.

With respect to the Apollo of the Belvedere, I shall add that one would be very much in the wrong to continue to cite this work as among the most beautiful of Greek art and to base a theory from the proportions of this statue. Certainly, the bearing is proud, with a certain grandeur and allure to its pose, but its workmanship is so-so, the design much too rounded, soft, and *indistinct*; this latter quality, moreover, is one of the proofs that this statue is not the original, but rather is a mediocre Greco-Roman copy executed in marble for the sake of being inserted into the general decoration of a monument, the original being made in bronze. In general, it is easy to determine when a sculpture has been conceived, on account of how the marble or bronze has been worked; one will not find any master sculptor belonging to any classical period in Art contravening this principle. For example, from the Egyptian school up to the time of Phidias, marble sculpture is always massive; it avoids thinness, holes and gaps, as well as freely positioned limbs. Michelangelo stated that a marble sculpture of a group of figures ought to be able to roll down from the summit of a mountain to its base without breaking. This principle had been followed by the ancient Greeks, not only in their sculptures of groups, but also for the isolated figures. Now, with bronze, on the other hand, it calls for thinness, disengaged movements, and a light silhouette, all of which the metal permits. Only in bronze can one fully comprehend (as one is unable to do otherwise) the spirit of the winged *God of Liberty* which surmounts the July Column. With the Apollo of the Belvedere, the outstretched arm bearing the bow is only connected to the body by a very slim cloak, thus demonstrating this statue to be a marble copy of a bronze original. Likewise, by its transparency marble forces the artist to incise the details more than what is required on metal, whose glistening nature combines better with supple and rounded forms; those of the Apollo of the Belvedere belong to this latter category, thereby reconfirming, messieurs, my judgment about this statue's origin.

DISCUSSION

Doctor PAUL BROCA. I shall not follow you, Monsieur Soldi, into the region of aesthetics; I leave it to others the trouble of criticizing or defending your position on the Apollo of the Belvedere. If I have spoken about this statue, it is because on ten or twelve occasions Professor Fock has erected and photographed it, after which he then drew in the contours of a skeleton on the photograph of the statue, doing so in order to apprehend the osteological proportions of the Greek canon; not once has he been able to find any skeleton



PHIDIAS IN HIS STUDY.

whose proportions are similar to those of this drawing. The arms were always too long, or the forearms too short. I believe I have told this story before to the Society, but it bears repeating. Professor Fock then appealed to Monsieur Vasseur for assistance, who searched vainly in his vast warehouses of osteology for a skeleton like the one of the Apollo of the Belvedere. Monsieur Vasseur next met with me in my laboratory, which only had but a single skeleton—that of a Negro (the one of Abdallah)—and this skeleton found itself conforming to the searched-for type. Monsieur Vasseur, not having a skeleton of a Negro, then decided to refashion it into a European skeleton; in doing this he was obliged to shorten the humerus by about 2 centimeters via a resection made at the middle of the diaphysis. So, messieurs, this is the context in which I have talked about the Apollo of the Belvedere. However, the observation that I made did not particularly concern this statue. I have measured the length of the arms and forearms of other statues dating from antiquity; additionally, I have examined the sketch-books belonging to the library of the School of Fine Arts, measuring the arm lengths of the ancient statues portrayed in these sketch-books. In general, what I was able to establish was that the ancients would make the arms shorter in proportion to the forearms than what is found today in our own arm length proportions. The proportions that they adopted are not to be found, at least not at present, in European people, and probably did not exist in earlier times as well. Now, these proportions are, in fact, ones that we find among Negroes and Nubians. Nubians, as Madame Clémence Royer has noted, are not true flat-nosed, thick-lipped, woolly-haired Negroes; nevertheless, their osteological characteristics are Negritic; and, you recall that it was precisely one of the Nubians of the Jardin d'Acclimatation which gave rise to the interesting photographs Doctor Le Bon showed us at our meeting two weeks ago. Moreover, everybody knows that true woolly-haired Negroes are very frequently depicted as slaves on the monuments of Egypt.

Granted, Monsieur Soldi, you do not see the presence of Negroid proportions in the Greek canon of sculpture; so be it. I shall not speak of their canon. However, what is inarguable is that the Greek sculptors possessed rules, and if they did not always follow them, they at least meant to follow them. The story of the two sons of Rhoecus, Telecles and Theodore, who made up, according to Diodorus of Sicily, the two halves of the same statue of Apollo (one half being on Samos, the other at Ephesus)—a statue, mind you, that conformed to the Egyptian method—is evidently only a legend; but, this statue would not have originated if the Greeks had not believed in the fixity of the proportions of the human body and if these proportions had not been regulated by their artists.

Professor EUGÈNE DALLY. The Count of La Borde and Monsieur Reiset have investigated the proportions of all the statues in the Louvre, and they found that none of them correspond exactly, in all their parts, to the canon of Polyclitus. Not one artist of the Renaissance nor of the following centuries submitted himself to this canon. I therefore believe, Doctor Broca, that the canon of the Greeks has been invented well after the event.

Doctor PAUL BROCA. I was not talking about the canon of Polyclitus, but only about the relative length of the arms and forearms.

Monsieur GAULTIER DE CLAUBRY. The assertions of Diodorus of Sicily are subject to caution; many of them have been plainly contradicted by science.

Monsieur EMILE SOLDI. I gladly second your observation, Monsieur de Claubry, and believe that one ought not to accept without reservation any Greek assertion. At a future meeting I'll introduce the Society to a book I wrote whose purpose was to contradict an assertion made by Plato and also to prove that only hieratic art made its presence in ancient Egypt.

I do not have faith anymore in the existence of a Greek canon. The rules followed in the making of the statuary about which you spoke, Doctor Broca, are hardly absolute; the sculptor can easily modify them according to the effect that he desires to obtain, sometimes just by the quantity of marble he has at his disposal.

In general, the sculptors of ancient Greece as well as modern-day sculptors are captivated by aristocratic beauty, by a type. There is but one preoccupation: to render the person being sculpted with all his peculiarities, to create the most exact copy possible. The Greek sculptor would take the measurement not only of the entire individual, but also of all the shapes comprising that individual. He knew that these latter vary to infinity, vary by age, temperament, profession, and one's country of origin, plus are modified by whatever motions or gestures the individual is making. He would only change the proportions of certain parts of the model according to the theme and expression that he was depicting, and in order to make allowance for the spot where his work would be placed; questions of perspective, proximity, and projection resulted in different attenuations or exaggerations of the shapes. In this manner he would exaggerate the gesturing hand, the face of one in deep thought, the heads of statues positioned at the top of a temple, or reduce certain shapes of statues of women placed near to view.

In ancient Greece, just like today, these principles were followed. Likewise, one is not able to find two Greek statues sharing the same proportions—at least according to my reckoning this has never been attained, because I have measured a great many such statues.

It is well known that only original statues must be the subject of comparison, and not the thousands of copies or imitations that encumber museums nowadays. The fake Venus de Medicis and the Venus de Milo fakes might be regarded as having between them a certain similitude of proportions, shapes, and look; but, for this observation to be of any significance one would have to make the far-fetched accusation that the artists of ancient Greece and Egypt, instead of their imitators, produced copies ceaselessly of their own works. Now, some artists in each age have yielded to the temptation of presenting to their pupils a few rules of proportion, but as these are never more than generalities, the master or creator knows to avoid them whenever he finds himself working before nature and its infinite varieties; likewise, these rules are always set aside by the pupil upon his becoming the master.

Monsieur CHARLES ROCHET. I do not think that there exists any Greek statue

of the Classical Age that does not have too small a head or a shinbone too long. The Greek sculptors were not like the fantasists of our century: they considered themselves obligated to represent the divinities according to a uniform type with regard to the height and width.

Monsieur EMILE SOLDI. I shall not enter into a discussion about the ideal beauty and aesthetics of the Greeks, as these are matters of sentiment and taste, which deviate from established or incontestable facts. For a great many motifs it is necessary to be suspicious of any scientific thesis being stressed respecting a certain work of art and its proportions; the artist is much too changeable, too independent by nature to confine himself, believing as much in rules as in the independent observations of his own free will. Often, besides the artist's imagination and fancy, a material necessity will make him alter a shape: lack of marble, for example, the need to solidify this or that part of his work, an erroneous blow of the chisel that he must redo or correct might compel him to modify his work's proportions; additionally, of course, the image of the model or person that is before his eyes greatly influences the appearance of the final product. It is only when a work of art possesses profoundly accentuated shapes and atypical peculiarities, or when it belongs to the distant past, that it may usefully be of service to ethnographic studies. Such are the bas-reliefs of the Second Dynasty in Egypt, in which a wholly particular type is represented. I therefore believe, messieurs, that in science one must above all interest himself more in uncovering and highlighting the dissemblances rather than the resemblances, because the latter can always be detected, which, while being conducive to all theories, do not really provide a serious basis to any.

As 1879 drew to a close, the first public performance of Franck's Piano Quintet neared, this event transpiring in January the following year. But, this is a story best left for next time after I sort through my piles some more.

Wishing you good cheer, I remain, as ever,

Your friend,

Robert

REMINISCENCES OF A FREQUENTER
TO THE
1880 MEETINGS
OF THE
ANTHROPOLOGY SOCIETY OF PARIS

Featuring:

*Classic presentations by Doctor Paul Broca, Girard de Rialle,
Doctor Antoine Foley, Charles de Ujfalvy, Professor Adolf Meyer,
Laurent Féraud, Doctor Arthur Chervin, Francisco Moreno,
and Colonel Émile Duhousset*

Robert K. Stevenson: Translator, Editor & Reminiscencer



The reminiscencer in 1880

86, rue de Courcelles
Paris, France

August 12, 1929

My dear friend,

I was, as I often do, thinking of you when your letter of the 6th arrived, and am not surprised over your finding Le Bon's "Question of Criminals" paper a revelation. You did note, no doubt, his discussion of the mentality of those who perpetrate fraud. I mention this because I am quite frankly uneasy about your recent stock purchases and hope that they are, in fact, solid investments and not instead concoctions of "shady financial enterprises" to which Le Bon refers; in my opinion, both of us should be most careful with our savings, such as they are.

You will very much appreciate, I'm sure, today's shipment of papers which date from 1880. A lot of these presentations will ring a bell because, as you recall (and certainly I can never forget), 1880 was when we first met—a mere snap of the fingers, so to speak.

You weren't in the same picture with me yet when I attended the Society's meeting of January 8th. My recollections of the Bushmen drawings Laurent Féraud brought in that day are somewhat vague, but I definitely remember Girard de Rialle's en-lightning (a pun, as you probably gather) talk on the swastika, which highlighted this emblem's association with, and representation of, thunderbolts.

“On the Bushmen and Hottentots”

by **Laurent Féraud**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of January 8, 1880

Messieurs, for the last two years I have lived in southern Africa, and today I wish to present to the Society copies of some drawings executed by Bushmen. These copies, as you can see, are made uniformly in red and black. This latter color, however, is never employed by the Bushmen themselves because they do not admit that such be their color; and, in fact, they are rather yellowish in appearance with slightly oblique and narrow eyes. This drawing that I'm now holding represents, in my opinion, a sorcerer in the process of casting a spell on a bull; two women are with him. I should add that Bushmen drawings are often lewd.

The Bushmen race is very much reduced nowadays. From what I have seen only one twentieth of their race is pure; the others are crossbred with Hottentot blood; their height I estimate to be between 1.3 and 1.5 meters.

In Capetown Province tumuli are in existence; people attribute them to a massacre of Hottentots which took place there three hundred years ago. Monsieur Hugo, a colonist of French origin, has excavated these burial mounds and has found inside them weapons used by Bushmen.

The Bushmen have a curious mythology and astronomy, assigning to stars the names of animals of which they avail themselves. According to them, the phases of the moon are due to the sun cutting off portions of it in order to eat; and when the moon is thus reduced to nothing, the story goes that it has supplied the sun with the means to grow in order to attend to the sustenance of its newborn child (that is, the new moon).

It turns out that the language of the Bushmen is very difficult to speak on account of the *clicks* which characterize it, and which are very hard to imitate; they have a labial click, a dental click, a lateral click, a guttural one, and others also that are intermediate between the preceding.

The Hottentots, by contrast, employ only six different clicks; the Kaffirs but three: in this manner the name of the Zulu king—Cetiwayo—who recently acquired such a great celebrity presents a click on the first syllable; we Europeans have replaced this sound with a *c*.

DISCUSSION

Doctor PAUL TOPINARD. The Society is already familiar with the Bushmen drawings that have been sent to us by Monsieur Todd, which notably differ from the ones that you have shown us today, Monsieur Féraud. Among other things, I find significant the exaggerated steatopygia that the personages in Monsieur Todd's drawings present. I am surprised, Monsieur Féraud, not to also see the same in the drawings you've brought.

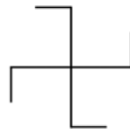
“The Meaning of the Swastika Cross and Other Emblems of the Same Nature”

by Girard de Rialle

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of January 8, 1880

Messieurs, among the decorative motifs found on ceramic and metal objects dating back to the Bronze Age, I wish to discuss today one which has drawn a great deal of attention from archeologists. I am referring, of course, to the cross whose branches are bent back in the shape of a hook:



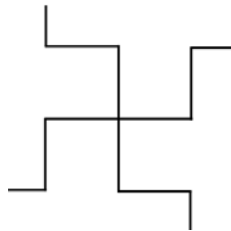
This cross is considered native to India, where one comes across it and where it takes the name of the *swastika*. Also, from this fact can be drawn the conclusion that the various objects which bear this sign and which one finds in prehistoric sites in Europe are of Indian origin or, more correctly speaking, are the products of an art and industry intimately related to those of ancient India.

I shall not concern myself here with enumerating the numerous finds from sifted through debris of this hook-shaped cross. It is sufficient to point out that some have been discovered in most parts of Europe and also in Asia Minor. Additionally, the hypothesis that considers this sign a characteristic mark of the Aryan conquest does not appear to me to be denuded of likelihood.

But, given that this cross was so widespread and occupies, as it does, the center of an ensemble of ornamentation, must it not have some special meaning? Indeed, it does. In India, messieurs, the *swastika* possesses a sacred quality; it is a mystical sign. Unfortunately, the word itself does not reveal to us with precision through its constituent elements the original meaning that it had. It is by extension that it has acquired the meaning of the crossroads—the intersections of lines or ways—of the cross. In fact, it is composed of the word *swasti* and the adjectival suffix *ka*. Now, *swasti* is itself a form of blessing, salutation, and approbation, composed in its turn of the adverb *su*—“rightly” or “well”—and of the third person present indicative of the verb *asti*—“to be.” Therefore we can see that *swasti* is but a simple expression, something like our “c’est bien,” that over time and with continued use has become a sacred formula, being somewhat analogous to the *amen* of Christians. Moreover, the employment of this formula dates back to very ancient times inasmuch as we already find it being used in its hieratic sense in the Rig-Veda (verse 3 of hymn 14 of the 7th mandala). Etymologically, *swastika* therefore only signifies “that which belongs to the form of blessing,” in other words, “a good luck charm.”

We can see that there already existed a sufficient motive for this specially shaped cross to figure so often in common objects, weapons, and jewelry. In abundantly producing and representing the *swastika*, the various peoples who spread into Asia and Europe at first were obedient to a superstitious sentiment, then later on to a custom. Since the diffusion of Christianity a similar process has occurred with regard to the emblem of redemption. Likewise Sivaism has propagated at all times the *lingam* as an object of piety and decorative motif; but, unlike with the *swastika* we do not possess for it the original and inner meaning.

A short time ago I read a recent German work on prehistoric archeology in Eastern Europe (*Materialien zur Urgeschichte des Menschen in æstlichen Europa*, by Messieurs Kohn and Mehlig, 2 volumes, 1879). Now, in the account by Monsieur Jasmin of the diggings of the tumulus of Legnica in Poland I came across the representation of a small, yellow clay vase with handle, on the lowest part of which the following design manifests itself: a *swastika* centered between four groups of three chevrons inserted one inside the other. The *swastika* presents also a second hook. This shape is even, it seems, more accentuated in other cases and each branch of the cross presents the aspect of a repeatedly broken line:



Now, this sign is called in Poland, after the local tradition, “the thunderbolts of Perun.”

This indication, in my opinion, casts great light on the original meaning of the *swastika*. It is the mythological representation of lightning, that is to say of the thunderbolts of the thunder god, and the four broken lines thus simulate the zigzags of lightning.

The thunder god has been the great national divinity of the bellicose and conquering peoples of Aryan origin. In nearly all branches of this family, it is he who has preeminence or who is the most ardently invoked. With the Slavs, *Perun* (with the Lithuanians, *Perkunas*) is the chief god—the king of gods—and by his name and also by his attributes and duties he corresponds to the old Vedic god *Parjanya*, the divine bull who bellows during storms and sprays, in the shape of rain, his semen over the earth in order to fecundate it. The Aryans of the Vedic era transferred their belief in this cult to another thunder god—*Indra*.

The Greeks and the Romans had *Zeus* and *Jupiter* respectively, each being god of the heavens and lightning, victorious enemy of the giants and malevolent genies hidden in the dark clouds who he tears apart with great blows of his thunder. For the Germans and the Scandinavians, *Donar* or *Thor*, although subordinate to *Woden* or *Odin*, were not any less powerful than the latter. That the representation of the weapon of the god of lightning, that the hook-shaped cross—the *swastika*—has thus become the preferred sign and mark of the Aryo-Europeans, altogether their “good luck charm,” to my eyes makes total sense, and I propose that we accept this as the most likely meaning until we are more amply informed.

This symbolization of god by his weapon is, moreover, nothing new. *Thor*, who I just mentioned, is armed, according to tradition, with a magic ax-hammer which he flings upon his adversaries and which returns itself to his hands. Now, messieurs, it turns out that ax-hammers were used by men throughout northern Europe during both the Stone Age and Bronze Age; therefore the mythological tradition of *Thor* should come as no surprise.

In Greece and in Asia Minor, the Ionians, Carians, and Lydians had as their national weapon the double-headed ax. Now, this ax has been the emblem of *Zeus* who at Miletus and Halicarnassus took the surname *Labrandeus* (Plutarch said that “ax” is called *labrus* in Lydia), and who was represented in the temples and on coins as holding this ax in one hand and a lance in the other. Additionally, he was *Zeus Chrysaorias*, with gold sword in hand, that is to say, he was the god of the heavens and lightning.

DISCUSSION

Monsieur GABRIEL DE MORTILLET. What I see in the *swastika* is a representation of the instrument that serves to make fire; my opinion nevertheless also lends support to your well-reasoned conclusion, Monsieur de Rialle.

Lest I not forget, nine days later, on January 17th, was the first public performance of Franck's Piano Quintet, which premiered in a concert of the Société Nationale. I attended with d'Indy, and the piece brought down the house—save one. It turns out that Franck, with good intentions but not good foresight, had dedicated the Quintet to his rival, Camille Saint-Saëns, who played the piano part splendidly (though grudgingly, apparently) during the performance. After the concert d'Indy and I made our way backstage and watched agog while a beaming Franck tried to present as a gift the piece's manuscript to the pianist, who proceeded to disgustedly turn his back on the master and leave the hall forthwith sans manuscript. I do not believe the two ever spoke to one another again (or so I was informed by Le Bon, who frequently had Saint-Saëns over for his soirées).

The Society's February meeting offered a decent presentation by Doctor Chervin on the Estonians, but it was the March 4th meeting that truly stands out. Doctor Broca began by sharing his rather provocative research on a recently-deceased woman who he claimed was a Zulu (not to Hovelacque's satisfaction, however, who believed her to be a Bushman; also, you won't want to overlook Broca's punch line). But, this talk, interesting as it was, was but a mere appetizer. Broca next escorted in an 11-year-old boy, Jacques Arnodi by name, who was a genius at solving very difficult mathematical problems completely in his head. The lad, chiming in at times, stood at Broca's side as the scientist described Jacques' remarkable calculating abilities. I had never seen the entire membership so transfixed as during this talk, and I know that you, like myself, would have wanted to have seen for yourself the boy demonstrating his prowess.

“Some Skulls of Estonians”


by **Doctor Arthur Chervin**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of February 19, 1880

At our last meeting I had the honor of presenting to you, from the hand of Doctor Ludwig Stieda of Dorpat, four skulls of Estonians; and I have the pleasure of offering to you today, in my own name, this complete skeleton of the same provenance which you now behold. I am so much the happier making this donation to the Society given that our museum, so rich in many respects, only possesses a few skulls and a single skeleton that are solely Estonian.

I shall not enter into a detailed description of this skeleton, and shall instead restrict myself to saying that the measurements obtained on the four skulls submitted by Doctor Stieda as well as on the skeleton are completely in accord with those taken by Doctor Broca in 1868 on four or five skulls that he had at his disposal.

	Skulls (from Doctor Stieda)				Skull of Skeleton (from Doctor Chervin)
					
	No. 1	No. 2	No. 3	No. 4	
Antero-posterior diameter.....	174	183	184	181	184
Transverse maximum diameter....	138	146	142	142	140
Cephalic index.....	79.31	79.77	77.17	78.45	77.17
Basibregmatic diameter	128	139	128	136	122
Frontal minimum diameter	0.96	102	98	100	100
Bizygomatic width.....	124	—	132	135	130

I must point out that Skull No. 1 is a female; the rest are male. The average cephalic index is 78.37 for the five skulls; they are therefore mesocephalic.

The skull belonging to the skeleton presents a slight prognathism that perhaps merits special mention; and I must tell you in passing that this skeleton is one of a man whose place of origin is perfectly known, for he died in the hospital at Dorpat and was a pure Estonian.

You will observe, messieurs, with this skeleton as with the other Estonian skulls, that the frontal brows are very prominent and that the glabella is partially depressed.

The forehead is receding and low, and if you measure the vertical diameter, you will see that it is only 122. It is therefore quite evident that this skull's cubic capacity must be below average.

The width of the face does not present anything particular to note. However, there is one point which I wish to call to your attention. If, with this skeleton, you examine the anterior opening of the nostrils, you will be able to ascertain that instead of the projecting ridge that one generally encounters, there is a groove which, I believe, is frequently found in the skulls of Negroes and the great apes.

Additionally, it seems to me that the lower branch of the maxilla is wider than what one ordinarily finds, and that the notch that separates the coronoid apophysis and condyle is likewise wider and bigger than usual. I must also point out that these five skulls most revealingly present the supramastoidean projection that Doctor Broca noted on the Estonian skulls that he studied.

Furthermore, I need not remind you that at all times the inferior state of the Estonians has been signalized by researchers; this skeleton constitutes new proof of this opinion's firm foundation.

Lastly, messieurs, I have included with my donation of the skeleton 50 photographs which, I believe, you will find equally interesting from the point of view of the exterior physical aspect and manner of dress of the Estonians.

DISCUSSION

Doctor PAUL TOPINARD. I am not surprised, Doctor Chervin, to see that the Estonians you studied are mesocephalic. For a long time the Finnish have been, I believe, the object of an error; I have considered them to be mainly dolichocephalic instead of brachycephalic, a shape that over the years people have assigned to their skull.

“The Bust of a Young Zulu Woman”

by **Doctor Paul Broca**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 4, 1880

A young Zulu woman, nineteen years of age, died last week at Beaujon Hospital; she had been under the care of Doctor Féréol.

The body, not having been claimed, and therefore being destined for dissection, Doctor Féréol kindly informed me of its availability, and I saw to it that it was transported to our Society's laboratory. Before proceeding to its being dissected, Monsieur Chudzinski, our lab's lead assistant, himself cast this bust of the Zulu, which I am pleased to present to you today.

We know, of course, that the Zulus belong to the Bantu race, but geographically they are very close neighbors to the Hottentots and Bushmen. This proximity and the crossbreedings that have been able to be the consequence perhaps explains certain particularities of the skull of the young Zulu.

With the Hottentots, as with the Bushmen, the frontal region is very narrow and at the same time quite convex. The forehead's two bony prominences, which are very close to each other, mingle so to speak in a single middle curve. As you can see, messieurs, these characteristics are observable to a high degree in our young Zulu. However, her skin is black like that of the true Negroes, instead of being a fuliginous yellow like that of the Bushmen.

Soon, when the woman's skeleton is made ready, one will be able to see whether the proportions of the limbs are those of Negroes or those of Bushmen. It is no doubt useful to remind you that the antibrachial index or ratio of the length of the forearms to that of the arms averages 80 with Negroes, 74 with whites, and that this index measure for Hottentots and Bushmen, far from approaching the one for Negroes, falls on the contrary below the one for whites. Thus, it is only 70 in the Venus Hottentot, a number which the antibrachial index of the whites only very rarely descends to.

Lastly, I wish to show you this mold; it's of the young Zulu's leg and foot, which present the usual characteristics of what is found in Negroes. Note that the foot is flat, and the calf muscle projects out little and is very elongated.

DISCUSSION

Marquis DE NADAILLAC. Could you tell us, Doctor Broca, how this young woman's hair is implanted? Does it present the bristles of a brush appearance that distinguishes the Hottentots?

Doctor PAUL BROCA. The hair of our subject does not differ from that of ordinary Negroes. I had not taken up your question earlier, Marquis de Nadaillac, because results from some recent research indicate that the embedment of hair à la brush bristles is at least a contestable fact, that it is only an appearance due to the high degree of encoilmment of the hair. When the individual hairs are very short and the encircled region created by their encoilmment is tiny, they twist around each other, forming small cylindrical torsades akin to peppercorns. From this originated the idea that each torsade corresponds to a cluster of paintbrush bristles, separated from its neighbors by smooth intervals. This disposition of the hair is indeed normal with the Hottentots, but it is sometimes also observed in Negroes. Now, many of you remember that two years ago, on the initiative of Doctor Topinard, a commission was charged with the task of going to the Hôpital de la Charité to examine a Negro whose hair presented this disposition. The commissioners, having shaved the skin of the nape of the neck, discovered that the hairy follicles were uniformly distributed in regular rows, as is the case with us.

Doctor PAUL TOPINARD. I have two observations to make. First, I have measured very carefully the corpse of this woman and have compared its proportions with those of five or six cases of skeletons or bodies of Bushmen that science possesses. I intend to review these measurements on this woman's skeleton (once it is ready for examination), but at present I must say that they do not yield the proportions of African Negroes in general, represented among others by the Bantus, but correspond instead to those of Hottentots. The woman's height, in particular, is that of Hottentots and not of Bantus. My opinion is definitively that the woman is a Bantu and Hottentot crossbreed, and is *certainly not* a pure Zulu.

One most curious quality about this woman, among others, lends support to my opinion. She has extremely narrow eyes, similar to those of the Chinese, and I believe it so much the more necessary to bring this to your attention than any other part of her body that I have not been able to well understand.

An eye classified as *Chinese* has three characteristics. It is small, oblique, and narrow. Its smallness is mainly in appearance only: if you spread out the skin adjoining the eye's internal and external angle, the smallness as well as the obliqueness disappear. The principal element producing the apparent obliquity is a pinching and slight increase in height of the skin leading from the outside corner of the eyelids. Here is what accounts for the narrowness: at a variable height from outside the upper eyelid a cutaneous fold forms and accentuates itself, such that it reaches the point of being composed of two thin leaves of skin set back above the inward angle and then it falls abruptly, forming a vertically stretched veil that hides the caruncle. The caruncle is visible in its entirety in Europeans, but is more or less hidden in Chinese-type eyes—a clear distinction. In Chinese-type eyes the prominent narrowness hides one third, two thirds or all of the caruncle, depending on how pronounced the narrowness is, and one may easily note from 0 to 5 degrees its development according to the method you devised, Doctor Broca, for determining this characteristic.

With the Negress in question, if one represents the European eye as a 0 and the maximum degree of narrowness of the eye as a 5, her eyes would rate as a 3 or 4. Now, about 1800, Barrow, after returning from China and taking up his residence in Capetown,

emitted a doctrine which nowadays seems most erroneous; he asserted that the Chinese and Hottentots are similar, except for their hair. And, in fact, the comparative drawings that Barrow published show oblique eyes in the two sexes and some other common characteristics. Well, it turns out that this Negress from the Cape precisely presents to us an eye that is just as narrow as that of the Chinese and most assuredly as that of the Indochinese.

I would be remiss to conclude my point without reminding you that the eye called *Chinese* is sporadically observed in Europeans, mainly in females and children. In the latter it tends to diminish or disappear with the advancement of age, and this trait is absolutely distinct from another rare morphological detail of the eye—the presence of a winking membrane or vestige of the third eyelid of certain animals.

Finally, I must point out that this Negress does not possess the yellowish or oak tint of the Hottentots, but rather the black tint of the Bantus; she is not steatopygic, but I nevertheless make her out to be a crossbreed. She does not have hair that appears like peppercorns, but you know that this is no longer regarded as a distinguishing characteristic, as it had formerly been believed. Tuftlike hair, bushy hair or hair that looks like peppercorns is only an appearance that depends on the scarcity and shortness of the hair and on the degree that it coils up in a tight spiral; such hair is generally what one sees in a crowd of typical Negroes.

Monsieur ABEL HOVELACQUE. Doctor Broca, you told us that this young woman's skin is black. Her corpse is at present still in the laboratory and I went to view it a little while ago; I must say that I have not found her skin color to be that which distinguishes the Bantus. I questioned Monsieur Chudzinski on this point, and he told me that death had blackened the cadaver's skin since it had been there. In fact, at the bottom of some wrinkles one will see vestiges of a less dark color. It remains then for us to examine the skeleton in order to accurately determine the woman's race. However, her hand, such that a somewhat superficial examination has shown, appears to me to be the hand of a Bushman.

I do not believe, Doctor Topinard, that the question regarding the embedment of the hair in Bushmen has been definitively settled. I spoke at the Exposition with Capetown's governor-general, Monsieur Spencer Todd, and he affirmed that the hair of Bushmen is embedded in a bushlike manner; I carried on with my questions and asked him if he had seen what it looked like shaved, and he responded that he had seen on convicts what could not be truly said to be shaved hair, but instead was hair that had been cut as closely to the scalp as possible with scissors. In the presence of such testimonials and of those of travellers to Africa, it seems to me that it is difficult for European writers to settle this question.

Doctor PAUL TOPINARD. I recall, Monsieur Hovelacque, that the same official you spoke to at the Exposition, Monsieur Todd, has since then written a letter which has been published in our *Bulletins*, asserting that the individual hairs of Bushmen are uniformly distributed on the surface of the scalp.

Doctor PAUL BROCA. I have, messieurs, prepared another brief report titled “On a Regressive Anomaly of the Arch of the Aorta in a Young Zulu Woman,” whose main finding I believe is worth presenting now inasmuch as it highlights one more intriguing feature that the woman's body possesses.

In dissecting this young woman's body, Monsieur Chudzinski came upon an interesting anomaly.

As some of you know, in man the arch of the aorta gives birth successively to three large blood vessels: 1) the brachiocephalic trunk which after a short ways bifurcates, producing the right subclavian artery (S) and the right carotid artery (C); 2) the left carotid artery (C'); and 3) the left subclavian artery (S'). In carnivores the aorta's arch only furnishes two trunks: 1) a premier trunk, called the *innominate*, that divides itself into three arteries—S, C, and C'; 2) a second trunk, which is the left subclavian artery (S').

In ordinary monkeys, cebids, and pithecoids, the arch of the aorta presents the same type as that manifested in carnivores. In anthropoids the same case is found among gibbons and orang-outangs, but chimpanzees and gorillas present the human type.

The two types observed in primates can therefore be formulated in the following way:

Man, gorilla, chimpanzee. 2 + 1 + 1

Orang-outang, gibbons, and all the other apes . . . 3 + 1

The difference between these two types is not very great because we know that in man the origin of the left carotid artery is only separated by a small interval from that of the brachiocephalic trunk; the disappearance of this small interval is sufficient in order for these two major blood vessels to merge. Nevertheless, the difference of the two types is not without importance because it is in correspondence with the shape of the thorax, which is wider and less long in bipeds than in quadrupeds. Any time that the second type appears in man it can therefore be considered as a regressive anomaly.

Well, as you may surmise, the location of the branches of the aorta's arch present numerous anomalies; the explanation for many of them cannot be found in comparative anatomy and can only be attributed to accidents of development. The most interesting anomalies are those found in man that are normal in other animals, and the one I shall now show you in the name of Monsieur Chudzinski is of this variety.

Here, messieurs, you can see that the arch of the Zulu woman's aorta only gives birth to two large vessels. The second is the left subclavian artery, which is normal. The first one, though, much more voluminous, vertically ascends for about 1 centimeter, then divides into two trunks, namely: the brachiocephalic trunk which goes to the right and divides itself as usual, and the left carotid artery which goes to the left and soon retakes its normal position along the length of the neck. It turns out that this particular arrangement of the blood vessels is completely like the one that we observe in the orang-outang!

“On the Illiterate Child, Named Jacques Arnodi, Gifted with the Faculty of Performing Very Complicated Calculations”

by Doctor Paul Broca

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of March 4, 1880

Messieurs, you remember that during our last meeting our colleague, Monsieur d'Abbadie, talked to us about the singular faculty that aids certain individuals in being able to perform in their head very complicated calculations without assistance from ordinary arithmetic.

Two days later, Monsieur X..., who is today present at our meeting, came to me, introducing me to an eleven-year-old boy who possesses this faculty to a remarkable degree.

As you see, this child, named Jacques Arnodi, is also with us here today. He was born in Coni (Piedmont), but has mainly lived in the south of France. He accompanies his father, a street organ player, asking for coins. For the last few months he's been living with his older brother who is a waiter at a cafe in Marseille. The habitués of the cafe learned that this boy knows how to do calculations in his head. They amuse themselves by posing questions to him, making him do large multiplications or having him extract square roots and cube roots; and whenever he astonishes them, they give him a reward. Monsieur X..., having assisted at one of these small exhibitions, made arrangements with the older brother, and has conducted the boy here to Paris.

This boy is skinny, rather puny, and very small for his age. His trunk and limbs are well formed and do not present any sign of rickets. His head is quite voluminous in regard to his height; furthermore, it is very irregular in shape. A longitudinal depression on the median line of the forehead indicates that the metopic suture is persistent. The forehead is quite convex; the two frontal bumps are both most prominent, but the right is much more so than the left. The parietal bumps likewise are very pronounced, above all the left, so a certain degree of plagiocephaly exists. This conformation cannot be attributed to hydrocephaly and instead seems due to cerebral hypertrophy.

The boy is very intelligent; his look is lively, his physiognomy animated. He does not have any timidity. He does not know how to read or write. He has and sees numbers in his head, but he does not write them down.

Monsieur X..., when he brought the boy to me, told me that he never makes mistakes in his calculations, which he performs quickly, and that he especially excels in finding the square root of a number. However, without wishing to diminish at all your astonishment, I must say that the boy sometimes does make mistakes, as much with multiplication as with extracting square roots, and that the calculations that he performs in his head, howsoever

extraordinary that they are, are completed much more slowly than the computations that we do with a pen.

I first asked the boy to multiply a number by itself that I had taken from a table showing powers of 2. It was 65,356, I believe.

The Boy: It was not 65,356, but 65,536.

Doctor Broca: You see, messieurs, what a good memory he has for numbers; it was twelve days ago that I posed the question to him, and he remembered it better than me, even though on the one hand I have frequently had the occasion, in calculating probabilities, to avail myself of the Powers of 2 table, and even though on the other hand this remarkable child, having never before calculated beyond the third power or the cube root of these numbers, was entirely ignorant of, as you will see, the number that I had given him being the sixteenth power of 2.

He then began his multiplication, of which the product of 65,536 X 65,536 was under my eyes; and as he has the habit at the end of each of his partial operations of muttering his successive results, I have been able to apprehend some numbers and have established that he does not begin, like we do, by multiplying the units furthest to the right, but rather by multiplying the most elevated units of order, that is to say, by the units furthest to the left. Moreover, I have not been able to account for the nature of his multiplication processes.

During this time I continued to chat with Monsieur X...; the boy, though wholly engaged in calculating, followed our conversation and even mixed in some words, but without otherwise interrupting himself. Seven minutes elapsed in this manner, and I must say that by comparison, having performed myself the calculation by pen, I was able to finish the problem in one minute.

Incidentally, among other instinctive calculators who I have not yet observed, the renowned Henri Mondeux possesses, it is said, the faculty of calculating in his head faster than one can do by following ordinary arithmetical processes. I do not deny it, but this is not the case with our subject.

Now, at the end of seven minutes the boy made a magisterial gesture and said to me: "Here." And he then enunciated an answer that contained ten numbers, which began with 4 billion (I've forgotten the rest). The first seven numbers were correct, but the hundreds and tens column numbers were wrong. I do not remember any more about the error that he committed.

The Boy: I said 4,294,967,356 instead of 4,294,967,296.

Doctor Broca: I then told him that the billions, millions, and thousands were fine, but that the hundreds were wrong. He reflected an instant, less than a half-minute, and gave me this time the exact number, telling me that I had been right.

Monsieur X..., surprised at the error of his pupil, then requested me to make the boy perform the operation in which he excelled—the extraction of a square root.

I therefore asked for the square root of the same number—65,536. The root in this instance is 256, the eighth power of 2.

The extraction of the square root of a 5-digit number can be done by pen in 45 seconds. The boy devoted a little more than two minutes in working the problem, eventually telling me with assurance: “255.”

I told him that his answer was incorrect. He started over, first once, then several times, and always answered 255.

The Boy: I was wrong. 256 is the right answer.

Doctor Broca: He began anew his calculating, doing so without wishing to desist, and from my discussions with him I am not confident that he knows one of the primary hints of arithmetic. I told him, “How do you see that in multiplying 255 by itself, which ends with a 5, one obtains 65,536, which ends with a 6?” I have thoroughly ruminated upon my objection, and the boy's consistently answering 255 is impossible for me to understand.

With regard to the process that he follows in order to extract square roots, I was able to easily discover it. It is a process of feeling one's way—groping, if you will—just like the one that we follow in order to find a word in the dictionary. If I search for the word *bon*, I open the book towards its beginning where I know from experience that the *Bs* are located. If, for example, I land upon words that start with *ba*, I see that it is necessary to go on farther and therefore I advance. This time I land on words beginning with *bu* and see that I must go back the other direction; but, if I go back too far and now behold words starting with *bi*, I once again reverse direction and go forward, drawing nearer and nearer to my word until I eventually find it.

The boy operates in the same manner; although he has to an astonishing degree a memory for numbers, he does not yet know (perhaps he will later on) the square root of every number. However, he has inside his head landmarks which aid him in immediately recognizing that the square root of a number must lie between certain limits. He then successively tries, by squaring the various numbers contained within these limits (thanks to the faculty that he possesses of performing multiplications), to obtain the answer.

Thus, as soon as I had posed my question regarding the square root of 65,536, he immediately saw that the root must fall between 250 and 260, and in looking at his lips I saw that he was essaying first at 250. He found, though, that the square of 250 was too small; so, he tried out another number which I was unable to make out. Each time I noticed a slight movement of his head, indicating that he was trying out a new number. On his fourth attempt it appeared to me that he muttered “257.”

The Boy: You are right.

Doctor Broca: Then, after a short pause, he told me his final answer—255—the number with which he was so infatuated.

Now, you ask, how was this process of approximation by feeling one's way able to induce an error? It is clear that in attempting 255 it will be discovered that this number is too small; and it is clear, consequently, that the boy had not tried out 255. His error consisted in his belief that he had worked all the other neighboring numbers, whereas in reality he had neglected to try out 256. Disappointed and intimidated by his previous bad luck, he lost his composure, and having jumped from 254 which was too small to 257 which was too large, he believed that the only number that remained between these two was 255.

The Boy: That is what happened.

Doctor Broca: He had, messieurs, proceeded like the dog who, following a scent, arrives at a point where the path splits itself in three directions. He immediately engages himself by smelling out the first of these three paths, exploring it carefully, but doesn't find anything, and returns to the junction, resuming his search; he next examines in the same way the second path without any more success, returns again to the junction and this time, without hesitating and without wasting his time on an unnecessary inspection, darts down the third path, certain that his prey had passed only through there. He makes what one calls in medicine a "diagnosis by exclusion," proceeding under the assumption that the only way to validly determine the condition is to review all the possible cases; of course, if one forgets to review a single possibility, one might make a mistake, and this is what our young calculator did. But, it appears that he hardly ever makes such mistakes, and this is why the extraction of square roots is his favorite game.

Now, what most surprises his audience is the ease with which he extracts cube roots. This operation, when performed by utilizing a mathematical process, is very laborious; but, according to the empirical process that I laid bare and explained to you a couple of minutes ago, it is just as simple and fast as the extraction of a square root. All it amounts to is to try out some numbers and elevate them to the cube, and the boy carries out with the greatest facility these multiplications which it turns out entail relatively small numbers, for if the given number is less than a billion, the cube root cannot be larger than three digits, and is only two digits if the number is less than a million.

In brief, the extraordinary faculty of our subject is based entirely on the employment of a special and certainly empirical process of multiplication that I do not understand, one which the boy himself is probably incapable of explaining, but which is rendered possible for him to advantageously use by his prodigious memory of numbers. A number, however large that it may be, remains for a very long time engraved in his mind. You have seen, messieurs, with what precision he remembered a number larger than 4 billion that he had calculated in my presence twelve days ago. It is likely that he will not forget it for a long while, and I believe it is mainly by combining partial calculations that he has made previously that he is able to successfully perform multiplications of large numbers.

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I recall that the boy listened with great attention to Doctor Broca's talk. Afterwards, with my curiosity quite aroused, I asked the lad, "Jacques,

can you multiply 3,000,249 by 240,073?" He repeated the question two times with a certain slowness and immediately commenced his calculation.

While he worked the problem, some members of the Society exchanged various observations. Jacques overheard and considered their comments, sometimes responding to them, all the while continuing with his calculation. After nine minutes he extended his hand in order to announce that he had finished; he then stated the result three numbers at a time, pausing briefly between each installment of the answer:

"720 billion, 278 million, 778 thousand, 177. "

My friend, the boy's answer was absolutely correct. Amazing!

I clearly recall it was one afternoon in early April when I looked up from my corner spot at Henri's—and there you were! Le Bon had escorted you in and announced, "Robert, I wish to introduce to you an outstanding young talent like yourself—'Le intrépide,' but this is only my nickname for him—an apt one, as you'll discover. I shall leave the two of you to get to know one another better, as I must return home right away. Jeanmaire is there, assisting me today on some photographic experiments. We are trying out a new emulsion process and, I would say, are making excellent progress with it."

You were newly arrived to Paris, but it certainly didn't take you long to fit in. With a high degree of enthusiasm you accompanied me to the Society's April 15th meeting where you met many of the regulars and got in on two good presentations. I remember Doctor Foley telling us afterwards about the time he was in Tahiti and the natives offered him some "long pig"—which he thought so tasty! Then, the next day he learned what the main course really had been, nauseating him and undoubtedly served as inspiration for the prolonged lecture he gave the membership on the Polynesians' dietary problem.

But, what I most remember from those April days in 1880 is what you already well know. Along these lines, I thought you would enjoy having the enclosed picture of me, taken by Le Bon around the time we met. Which reminds me, nowadays, whenever someone tells me, "Oh, you don't look your age," I wonder if the person is actually thinking, "You look older." In any event, life is much more than the body, is it not? Le Bon, himself now 89, evidences this and, incidentally, wishes "Le intrépide" his best. Here now is what you heard at your first ever Society meeting—the first of so many for us together as frequenters.

Report on “The Ethnology of New Guinea”

by **Professor Adolf Meyer**
(Read by Doctor Paul Topinard)

ANTHROPOLOGY SOCIETY OF PARIS
Meeting of April 15, 1880

Messieurs, the three molds that I have requested Doctor Topinard to display to the Anthropology Society originate from a series of 135 Papuan skulls that I myself collected in 1873 in New Guinea and at Mysore Island in Geelvink Bay; I justifiably chose these three skulls from which to make the molds because these three deviate up to a certain point from the rest of the 132. They are 3 of the 4 out of 135 total skulls that Professor de Quatrefages and Doctor Hamy, in their *Crania ethnica* (pages 205+, 1876), have regarded as belonging to individuals of the Negrito-Papuan race: specifically, skull numbers 166, 70 and 97 with cephalic indexes of 80.2, 80.9 and 81.5 respectively, all three originating from Mysore Island. In my capacity as Director of the Natural History Museum of Dresden, I very much wish to give you, my French anthropology colleagues, the opportunity to examine at least the molds of these skulls that deviate from the series, so that you may be able to better judge if these skulls are so completely distinguishable from the rest, as the authors I just cited believe.

In a paper that I wrote three years ago on the 135 Papuan skulls (see *Mittheilungen des Kgl. Zoologischen Museum zu Dresden*, Vol. II, pp. 163-222, pl. VIII-X, 1877), I provided a table in which I arranged in order the entire series with respect to the cephalic index. Here is this table and its results:

Cephalic Index

65.2	1 skull
66.5 - 71.4	47 skulls
71.6 - 73.4	36 skulls (1 infant, 1 youth)
73.5 - 78.1	44 skulls (4 infants, 6 youths)
78.9 - 80.2	5 skulls (3 infants)
80.9 - 81.5	2 skulls

The same series, with the results broken down in greater detail:

Cephalic Index

65	1 skull
66	0 skull
67	5 skulls
68	5 skulls

Cephalic Index

69	5 skulls
70	15 skulls
71	17 skulls
72	18 skulls (1 youth)
73	18 skulls (1 infant)
74	14 skulls
75	7 skulls (1 infant, 1 youth)
76	13 skulls (1 infant, 2 youths)
77	6 skulls (2 infants, 1 youth)
78	4 skulls (2 youths)
79	2 skulls (2 infants)
80	0 skull
81	1 skull (1 infant)
82	1 skull

If one groups the skulls according to sex, and also excludes the infants and youths as well as the most defective and anomalous skulls, what remains is as follows:

54 Males

Cephalic Index

66.5 - 71.4	18 skulls
71.6 - 73.4	19 skulls
73.7 - 77.8	15 skulls
80.2	1 skull
80.9	1 skull

32 Females

Cephalic Index

66.6 - 71	17 skulls
71.8 - 73.4	7 skulls
73.5 - 76.4	8 skulls

(Skull number 97 was not included in this latter series because the skull is defective and also because I have been unable to determine its sex.)

I shall gladly subscribe to the opinion that there are properly so-called Negritos and that they are a race distinct to New Guinea, if there were some reason to convince me of this. Such has not been the case up to now. A discussion of this question will lead me too far at present, but I wish on this occasion to be permitted to say a word about some remarks Doctor Lesson recently made in his book: *les Polynesiens* (Paris, 1880), remarks that relate to me and which also touch upon this question. I shall restrict myself to discussing an error of fact on the part of Doctor Lesson, who is unaware of my report on the Papuans for the year 1873 which made its appearance in 1874 in the *Revue d'anthropologie*.

Doctor Lesson says on page 46 in his book this: "Quite recently the German journeyer Meyer asserted that the Arfakis do not differ constitutionally from the tribes that border the sea; this must be, he maintains, because without exception all the blacks of New Guinea, Malaysia, the Philippines, etc., are only formed from varieties of a single race."

The expression “*this must be*” gives the idea that I have treated these questions with a preconceived notion, or that I have done violence to the facts. In order to prove that the former is not the case, I shall quote a passage from a memorandum of mine that was published in 1873 in *Zeitschrift für Ethnologie* of Berlin (p. 45), concerning the similarities between the Negritos of the Philippines and the Papuans of New Guinea:

“It was in February, 1873 that Monsieur de Maclay and I joined up with each other at Tidore in the Moluccas, meeting up as well with the sultan and a company of about 60-80 Papuan men (who had just arrived directly from New Guinea). Monsieur de Maclay had come from Astrolabe Bay and had not yet been to the Philippines; it was just the opposite with myself: I had come from these islands and had not yet been to New Guinea. We conversed about these 60-80 Papuans that we beheld and also about the connection of the Negrito and Papuan races. I asked Monsieur de Maclay what seemed to me a very important question—that is, if these Papuans (from the western part of New Guinea) strongly resembled the Papuans of Astrolabe Bay (inhabiting the eastern part of New Guinea). He affirmed that he was unable to discern any difference, and as for myself, I was able to verify the exterior conformity between the Negritos of the Philippines and these Papuans. This exterior conformity is very salient and it forces serious consideration of the hypothesis of the two races being closely connected, by reason of the relatively small distance between the two countries that they inhabit.” (Monsieur de Maclay then related how several years ago a small ship from the Sangi Islands had landed against its crew's will in New Guinea, where I myself have seen some of these Sangi Islanders.)

This therefore is the actual observation in which I first presented my view about the intimate connection of these two races, and, as you can see, I did not entertain this question with any preconceived idea.

In order to substantiate also that I have not done violence to the facts, I shall restrict myself to citing the following passages of other observers and scholars, who are in accord with me, and who at the same time demonstrate that Doctor Lesson's judgement “that I do not have to be trained to observe either exactly or scientifically” is not sufficiently well-founded:

Page 112 of *l'Anthropologie du voyage au pôle sud et dans l'Océanie sur les corvettes l'Astrolabe et la Zélee* (Paris, 1854) contains this observation: “These Papuans have been found to be very similar at all the points visited along the coast. . . The natives of New Guinea who inhabit the mountains located a short distance from the coast are called Harfours or Arfakis. According to diverse accounts, these mountain people, often at war with the coastal tribes, *are not different with regard to anthropological qualities*. Explorers describe the two groups—the mountain and coastal tribes—as belonging to the same race.”

On page 119 of this same book we read the following: “A great homogeneity, certainly, prevails among all the inhabitants of New Guinea and the adjacent islands, and if there are distinctions that can be made, these distinctions can only be based on the most trifling differences. Malays frequently come to the islands located on the west side of the land of the Papuans, such as Waigen Island, Rawak, etc., coming for beche-de-mer or for trading with the natives. These habitual relations have resulted in the generation of some melanges, which have given rise to the Negro-Malay mixed race, first pointed out and described by Messieurs Quoy

and Gaimard. *These hybrids are sprinkled in small number amongst the Papuans; but, it would be extremely wrong to suppose that all Papuans belong to a mixed race.* Prichard has cited to us the observations of Monsieur Earl who, having visited the northern part of New Guinea many times, asserts that *there does not exist the slightest reason to consider the Papuans of this region as belonging to a hybrid race.* This traveller has, indeed, seen some half-breeds, but these differ a great deal from the veritable Papuans; they do not have, like the latter, woolly-tufted hair.”

On page 263, Professor de Quatrefages and Doctor Hamy, in their *Crania ethnica* (Book 6, 1878), state: “Do the Alfuru Arfakis belong to a different race than their nearby neighbors of the coast as Lesson and some others contend? . . . Ethnological studies demonstrate that throughout the Arfak mountain chain and in particular on the western summits, though Papuan negritos may sometimes be encountered, *the immense majority of the mountaineers of this region, as verified by the heads which we have been able to procure, undoubtedly belong to the pure Papuan race.*” (The description by Doctor Lesson of the Alfurus or, above all, of the Endamens, as he named them, in the vicinity of Doreh is in total contradiction with the descriptions given by his successors.)

Likewise, Monsieur de Maclay, who has visited so many places in New Guinea, is of the opinion that the mountaineers are of the same race as the inhabitants of the coast, which is just the opposite of Doctor Lesson's opinion.

I must remark that one is wrong to employ the name “Arfaki” as a general term pertaining only to the tribes of the Arfak mountains. The inhabitants of the village of Andai, for example, residing at the foot of the mountain range, are Arfakis because they came from the mountains and have lived there only a few years. With them and also with the residents of Hassam, a village in the mountains, I have spent a few weeks (like other travellers before and after me have done); consequently, Doctor Lesson's comment “that it is probable that Meyer has never had the occasion to observe the Arfakis closely” only shows how poorly informed he is and that he is not sufficiently acquainted with the writings of Messieurs Beccari, d'Albertis, de Rosenberg, and others.

Lastly, messieurs, throughout these parts of New Guinea there are, besides the Arfakis, other mountain tribes, such as the Arfus to the northwest of Doreh, the Karons near Amberbaki, etc., etc.

DISCUSSION

Doctor ERNEST HAMY. I have reservations regarding the subject of Professor Meyer's communication, and I intend on writing him presently.

Doctor PAUL TOPINARD. I shall not enter into the question that gave rise to the letter of Professor Meyer. Rather, I shall only deal with drawing a lesson from the measurements obtained via diverse methods of the three skulls whose molds you behold today as well as from the measurements that I myself have procured with the assistance of Professor Meyer at the Natural History Museum of Dresden, where these skulls are deposited.

For starters, messieurs, I shall recall for you the circumstances that occasioned my taking

these measurements and obtaining these molds for our museum. The three skulls which have been reproduced have acquired a certain celebrity thanks to the authors of *Crania ethnica*, who regard them as proof of the Negrito race's extension into the territory of New Guinea. They make up part of a collection of 135 Papuan skulls and were brought back from Mysore Island in Geelvink Bay (northern New Guinea) by Professor Meyer, who published their measurements and indexes in accordance with the ordering method that Doctor Broca discoursed upon here a few months ago. Here now are the measurements I obtained of the cephalic indexes of the 135 skulls; I have organized the list as a series of units, leaving out the decimals.

Cephalic Indexes	Number of Cases
65	1
66	3
67	6
68	5
69	8
70	13
71	19
72	19
73	20
74	9
75	6
76	12
77	5
78	3
79	3
80	2
81	1

This is a seriation as regular as one can find in any series of skulls: only the index of 76 repeats itself a little too much. The arithmetic mean is 72.8, and the range is 16.3; Cournot's probable measure extends from 71 to 73, inclusively. The extreme variations in the dolichocephalic sense drop down to 65 and 66, while the extreme variations in the brachycephalic sense go up to 80 and 81: all these values are rational.

The authors of *Crania ethnica*, however, believe that when one treats separately the last four cases—one at 79.9, two at 80, and one at 81—the average of 80.6 for these four that is obtained constitutes a significant number which, in their opinion, they accept as proof of the existence of brachycephalic blacks in the midst of the dolichocephalic blacks of New Guinea. I shall not debate here the merits of this treatment of the data, and for now only desire that we bear in mind Professor Meyer's published indexes.

These published indexes have, in fact, been obtained, not by the French method, but by a peculiar and little used new method in Germany: the Ihering method. Last year, while travelling to Moscow, and happening to have in my bag a communication precisely

regarding this unsatisfactory method, I visited the Museum of Dresden and immediately requested of its Director, Professor Meyer, permission to measure the 135 Papuan skulls according to our method; he eagerly granted me my request, and placed himself and his laboratory at my disposal.

What was behind my visit to Professor Meyer, given the interest that I have taken in these skulls, was the idea of making a mold of them and then having the molds sent to us. In his cover letter Professor Meyer says that these three skulls whose molds you behold distinguish themselves from the others by special qualities and he asks us for our opinion regarding them. I answered him by saying that in this case it is indispensable that we have in our hands one or two samples of the average type of the series. With the same promptness as before, Professor Meyer proceeded to make the molds of two skulls that occupy the very middle of the series by the ensemble of principal characteristics and measurements, and he also added a mold of each skull's cranial cavity. This constitutes the second shipment.

Let me return to my measurements. Here, messieurs, are the results for the four skulls possessing the highest cephalic index. The first table pertains to the Ihering method and is an extract of the numbers published by Professor Meyer. The second table contains the measurements that I myself have taken by following the usual method.

Ihering Method

Skull Number	Antero-Posterior Diameter	Transverse Diameter	Cephalic Index
148	173.5	138.5	79.8
166	172	138	81.5
97	162	132	81.4
70	181	146.5	80.9

Usual Method

148	170	136	80.0
166	178	136	76.4
97	164	128	78.0
70	180	134.5	74.7

The divergences between these two methods are considerable, as you can see, whether the absolute measures or the indexes are considered. The transverse diameter is always the largest by the Ihering method while the antero-posterior diameter is sometimes larger, two things that are easily comprehensible. For Skull Number 148 the correspondence between the two methods' measurements turns out by chance to be little modified, but for the other three skulls this correspondence is quite a different matter. This therefore is the result: for these latter three skulls the cephalic indexes are from 3 to 6 units larger by the Ihering method than are those obtained by the method that has the approval of the great majority of anthropologists in France, England, Italy, Russia, Germany, etc.; additionally,

these three skulls, reputed to be brachycephalic, are in reality either mesaticephalic (with one, Number 97) or dolichocephalic (with the two others, Numbers 70 and 166). The conclusions, messieurs, I believe you can draw for yourselves. I must point out, though, one important caveat, which is that in craniology the greatest danger is to try to harmonize numbers obtained by different methods, as it only leads to the gravest illusions.

What I have said here of a critical nature apropos the Ihering method, which at the moment entertains the pretention of substituting itself for the current method, can be repeated with respect to the Welcker method, and I recommend that persons interested in seeing additional proof of the Ihering and Welcker methods' deficiencies review the craniology study on the Chinese race that appeared in the latest issue of *Revue d'anthropologie*. Certainly, there are other disagreements over ways of properly measuring certain elements of the cephalic index, such as the anterior end of the ophryon's antero-posterior diameter; but, the differences that result here are generally imperceptible. On the other hand, the confusion that the Ihering and Welcker methods lead to have deplorable consequences, and one cannot emphasize enough the harm and mischief that they are able to produce.

In a few words, here is the Ihering method, evidently conceived at some desk in an office and not in the laboratory. It requires that one take the principal diameters by the method of projections, and that one inscribe the skull in a cube, with the aid of six planes that are brought together within the instrument specifically invented for this task. But, the difficulty in allowing this principle, that is, in taking projections to part of the face and skull, is in not mixing up elements belonging to one or the other, and also in not eliminating entirely accidental certainties which, however, are foreign to the sought for general conformation. Clearly, the inventor of this method and its instrument, both of which were realized on paper long ago before having been put into practice, did not at all foresee these problems.

Moreover, the first condition for taking any projection is to agree upon the plane or line of uniform orientation to adopt for the skull. And this is far from settled in Germany. Since the Congress of Göttingen, where attendees were reputedly well in agreement, the most diverse planes have been employed. In reality, one cannot reckon with the necessary precision the determination of this plane, and everyone ends up determining it pretty near to his taste and according to his own sentiment. Nevertheless, we find in books that planes of Baer, Camper, Lucae, and Merckel are treated. It is this last plane (Merckel's) that Monsieur Ihering has adopted for the orientation of the skull in the employment of his method; but, nothing in the construction of his instrument sets one to only think that he has intended this very exact orientation to be the premier condition of his method. The plane of Merckel, I remind you, runs from the auditory foramen to the lower border of the orbit.

I have, in fact, been desirous to see Monsieur Ihering's instrument operated not only under the hands of persons who have previously made use of it, but also to avail myself of it. I first established that, due to its very delicate handling, it should be employed with great care. Now, there is nothing that forecasts the orientation of the skull; it must therefore be oriented towards the averages. Next, one finds that the lateral planes, as they are brought together, meet each other at the zygomatic arches; also, by adding thin glass

plates, whose thickness one then subtracts, the planes more precisely meet at the projection (called *Estonian*, as I remember from a discussion that some years ago took place in this room) of the extension of the zygomatic arch's beginning.

Here now, messieurs, are the results that Professor Meyer and I obtained on two of the preceding skulls by rigorously employing, and with scrupulous care, the Ihering method with Merckel's plane of orientation:

Skull Numbers	Antero-Posterior Diameter	Transverse Diameter	Cephalic Index
166	172	138	80.2
70	181	137	75.7

In comparing the above cephalic indexes with the ones that I obtained by means of the usual method, we find a one unit difference in the index for Skull Number 70 and a four unit difference for Skull Number 166; that is to say, this latter skull, originally brachycephalic, becomes dolichocephalic. What valid findings can one make with an instrument that yields such large individual mistakes?

Here now are the differences resulting from the employment of a mode of orientation that our esteemed colleague, Doctor Broca, prefers:

	Skull Numbers	Antero-Posterior Diameter	Transverse Diameter	Cephalic Index
(Merckel's Plane)	70	181	137	75.7
(Broca's Plane)	70	180	143.5	79.7

As you can see, messieurs, the cephalic index result shows a difference of four units, with the dolichocephalic skull becoming brachycephalic in this case (and it must always be such, because Ihering's system is unable to indicate very large transverse diameters).

I would love to retake these measurements myself, successively taking them by orienting the skulls in accordance with each of the proposed planes. I have begun attempting to verify them on these very same molds; however, as we know, plaster shrinks unequally, and so this approach does not yield any precise comparison.

Nonetheless, I expect that we shall be enlightened soon by Professor Meyer himself, whose sole desire is to discern the truth. He is the head of one of the finest museums of anthropology in Germany, and certainly has claim to having a personal opinion. After having measured his large series of Papuan skulls by the Ihering method and by that of Welcker, and having compared the results, Professor Meyer is now disposed to measuring them anew by the French method, as I have named it, but which is at present practiced everywhere. The results will be published in one of the forthcoming issues of *Revue d'anthropologie*.

All these divergent measurements springing from radically different methods, or of varying ways of employing the same method, clearly prove, I believe, what I have most wished

to convey to you in my presentation today: that is, that the premier danger to avoid, when one brings in unfamiliar and foreign craniometric ideas, is to confound the numbers obtained by the diverse processes. Far from being useful to us, they can instead lead to the most regrettable illusions. Therefore, messieurs, I contend that adopting uniformity of a certain number of fundamental standards of measurement is today the foremost necessity of craniology.

Doctor PAUL BROCA. I completely share your opinion, Doctor Topinard, respecting the insufficiency of the orthogonal method (adopted by Monsieur Ihering to the exclusion of any other) and the enormous errors that can result; but, I think that it is only by abbreviation that you have named the ordinary method *French*, which is in opposition to the Ihering method. No doubt you mean to say that the ordinary method is the one used in France. I must point out that it is also used everywhere else; it is the one that has been employed from the very beginning. Additionally, it is the first method devised that wishes to perceive the dimensions of the skull by having entirely natural recourse, and it will not be otherwise because this method entails one measuring directly the cranial lines by applying a compass upon their two end points. If therefore one sees fit to give a name, it should be called the *general method*, even though the choice of guiding-marks can make the results vary. It is in this manner that those wishing to determine the length of the skull sometimes measure the maximum antero-posterior diameter, sometimes the glabella-inion diameter, and so on; but all these approaches are similar in the sense that they have in view to directly measure on the skull the distance between two points or two parts of the skull. I shall add that these divergent approaches are tending more and more to disappear, and that researchers today are nearly unanimous in representing the skull's length by the line named *maximum antero-posterior diameter*.

In place of this, what is Monsieur Ihering's approach? He plots all the cranial lines in three cardinal planes: one plane being horizontal, another vertical, and the third transversal; he deems it unnecessary to measure the lines themselves, and it suffices him to measure their projections upon one of the principal planes. Also, according to him, the skull's length is not the antero-posterior diameter; instead, he maintains that it is the distance between the two perpendiculars dropped from the two end points of this diameter onto the horizontal plane. Now, this projection is always shorter than the diameter that it represents because, as we know, the latter is always oblique. The antero-posterior diameter's inclination, in regard to the horizon, is, moreover, quite variable; it is often lower by 20 degrees, or sometimes it is elevated up to 33 degrees, and these variations depend very much less on the general architecture of the skull than on the particular conformation of the occiput.

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Doctor Broca's remarks at this point increased by an order of magnitude in their level of technicality, and as I recall that they did not particularly interest us at the time, why should they now?

So, let us turn to fare that you and I found much more stimulating, Doctor Foley's "Reflections on the Human Races."

“Reflections on the Human Races”

by **Doctor Antoine Foley**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of April 15, 1880

Messieurs, the work that I have recently offered to the Anthropology Society has for its title: *le Dix-neuvième Siècle et sa Devise*; and for its epigraph this phrase was borrowed from the *Méditations* of Descartes:

“The mind is so strongly dependent on the constitution and disposition of the organs of the body that, if it is possible to find any way that produces men who are wiser and more able than they have been up to now, it is in medicine that one should look.”

From this epigraph and the title of my book, if you have already drawn the conclusion that it is devoted in very large part to politics, you have not deceived yourselves. And you will deceive yourselves even less if you add that I have striven to show that the foundation of the art of governing is the science of man and the societies that he organizes; because, among other questions that I have tried to answer in the affirmative, this one is met with:

“The natural sciences (as well as anthropology and sociology most particularly), which people are beginning to regard as exact, are they already sufficiently developed and practical so that it is possible with their principles to guide individual, domestic, professional, civil, political and also religious existence?”

Now, I shall not discuss here either the first or the last part of my book, both of which, I repeat, deal with politics. But, the middle part, does it also deal with politics? Most certainly not, because it enters into the object of your studies, messieurs, treating:

- 1) Man, moral as well as physical;
- 2) The formation of the different races;
- 3) Societies (large or small) that are at first entirely organized empirically, but afterwards are organized more and more systematically, and finally
- 4) Social categories, in these societies taking shape, that outline themselves for the short amount of time that they exist—for example, for the few days that the central Australian aborigine employs to find and impregnate his temporary wife.

Here now, in the order that I have presented them, are the subjects and anthropological and sociological problems that I have endeavored to resolve, or at the very least to put into an equation, in the middle part of my book:

I

Reflections on man, regarded as a threefold organism, whose life, movement, and thought are only functional resultants.

In arriving at this opinion, which still has many opponents, I am supported by the following propositions and facts:

Just as there is only one astronomy and one physics, there is only one organic chemistry.

The living being, such that he is, is influenced and impressed by a world that always changes; and in this world (which always changes) the living being is governed by a nervous system, just as much impressionable as it is able itself to produce an impression, which also will always change.

II

Memory, the conscience, prejudice, originality, madness and genius (more and more social products) are only the resultants of manners of being and functioning that our encephalic nervous elements adopt by dint of their being impressed the same way, sometimes by our own organism; sometimes only by the moral milieu that surrounds us; sometimes also by the material environment in whose midst we live; but, most often, by the preceding all together.

Resolve, a threefold resultant of our being active, emotional, and intellectual, is nearly, if not entirely, nonexistent in the savage.

The ordinary civilized person borrows enormously from custom, the latest fashion, and prejudice.

The fool, like the man of genius, is the result of an almost exclusively original effort, generally excessive work that, with the former, is based on an error; with the latter, based on a truth.

III

General reflections on the black, colored, and white races, viewed as the three great resultants (totally savage at first, but then becoming civilized little by little) that the three main climates of our terrestrial globe have brought about in our species.

In order to treat this question of the races, I have drawn inspiration from the following propositions:

Our organism (like each of its organs, tissues, and constituent elements) is completely variable within certain anatomico-physiological limits.

In 24 hours we are only able to make a certain quantity of blood and tissue, so that if too much is consumed now, too little will be able to be consumed later.

It is by forging that one becomes forged; or, to put it another way, the organ that one uses develops itself, while the organ that one misuses (be it more or less) atrophies.

Finally, it is only by taking stock of the physico-chemical, mechanical and aesthetical-sensory modifications of our environment, as well as the indispensable modifications of our products, productive organs, and nervous centers (which govern us), that one can account for the aspects and forms that the human body presents.

IV

Reflections on the three vital modes or, if you prefer, on the three particular ways of being, acting and thinking, that our three sorts of great races or human variants have respectively entered upon in forming themselves in both the Old and New World.

These three vital modes, as we shall see later on, are copied respectively by the vital mode of the infant, adult, and man of mature age.

V

Specific reflections on the black races of the Old World as well as the New World.

These races merit, I contend, the surname *vegetative-sentimentals*:

Because they comprise the specimens of what man becomes to the physical as well as to the moral;

When, as much as anatomico-physiological limits permit him, he has sacrificed (from father to son, from generation to generation, and from century to century) his mechanical aptitudes of the animal (more or less energetic) and his mental faculties of thinking (more or less intelligent) to the development and to the maximum power of his visceral and instinctive organs;

When, as I said, he has made this double sacrifice; because, among the obstacles of all sorts that fetter his existence and that of his race, those that surpass all the others pose to him problems in this fundamental order:

Firstly, by virtue of the deplorable qualities of the agents (physico-chemical) and aliments (solids, liquids and gaseous) that his environment offers to his digestive, respiratory, perspiratory and other organs, in order to maintain his plasticity;

Secondly, by virtue of the mechanical impulses, also deplorable, that this same environment offers to his ambulatory, prehensory, abducent, adducent and related organs, in order to provide for his motility; and

Thirdly, by virtue of the likewise deplorable ways of living, phenomena or aesthetic spectacles (auditory, optical, olfactory, sapid or appreciably tactile) that this same environment presents to his sensori-exploratory organs, in order to feed his mentality.

Speaking thusly, I then make particular allusion to the Negroes and Papuans, who live in 1) the torrid zone, 2) inordinately dry areas (such as certain deserts of Africa, Asia, and Australia), or 3) excessively humid localities (such as certain shorelands, riverbanks, deltas or low-lying islands of Africa, Asia, and Australia).

Localities where the aforementioned vital problems confront the human organism are as follows:

First problem. — How man . . . absolutely naked in the sun, in a perfectly dry country, where a thermometer placed on the ground can go up to 70 degrees Celsius (and even 84 degrees, if one coats his container with lampblack) . . . will it not specially prepare his skin, glandular organs, hair, coloring and so on, in which he depends, in order that he does not die in isolation?

Second problem. — How man . . . only obtains, for arterializing his blood, air as rarefied as it is warm and irritating for his pulmonary mucous . . . will it not uniquely dispose his respiratory, circulatory, and above all his perspiratory organs so that he does not die from asphyxiation?

Third problem. — How man . . . immersed in an exceedingly marshy atmosphere, or having only completely putrid and febriferous water to drink . . . will these conditions make his intestinal and depurative organs such that he is not more unhealthy than the mammals, birds, reptiles, hippopotamuses, ibises, and crocodiles which surround him, and able as well, like these animals, to absorb febriferous elements through the skin and the pulmonary and gastrointestinal mucous?

Fourth problem. — How man . . . not having on occasion the possibility of eating for five, six, seven, eight or nine whole days . . . will it not dispose the walls of his abdomen, plus his entire digestive apparatus, as well as his reserves of adipose cells to be such that they allow him to ingurgitate, digest, absorb and, little by little, reabsorb that which he must of solid, liquid, and gaseous elements in order to live five, six, seven, eight, or even nine days?

I have cited only four problems belonging to the vegetative-biological category that are posed to the black by his environment, and resolved by his organism. I could cite many more, without counting all those falling under the mechanico-muscular and sensori-aesthetic categories.

VI

I consider next in my book the colored races (of the Old World as well as the New

World), and I state that they merit the surnames musculo-voluntaries or practical-actives of our species; because they comprise the specimens of what man is (to the moral as well as to the physical) when he seems to have developed, as much as it can be done, his bodily machine to move vigorously and the nervous system that governs it, to the detriment of his visceral and sensory organs as well as to the detriment of the nervous systems that likewise govern them. Or, if you please, I say of the colored races that they merit the aforementioned surnames because they comprise the specimens of a man who appears to have exaggerated all the organs that most particularly govern his nerves, ganglions and plexuses of spinal origin, his spinal marrow, his pericerebellar crown and (perhaps also) the middle peripheral region of his brain—the peripheral region where (probably) our aesthetic images form themselves. These exaggerations, I continue, manifest themselves in the colored man because of all the obstacles that he has to surmount in order to live, the most preponderant are of a mechanical nature and, hence, exact as much force and address of his muscles as they do of the tenacity of his character.

Speaking in this manner, I then make allusion on the one hand to the quite vast spaces (nautical or indeed terrestrial) and monsters (plant or animal) that the two Americas have set in opposition to their native redskins up to now; and, on the other hand, to the spaces and monsters, no less considerable, that Asia and Malaysia have likewise put in opposition up to now to, in the former's case, its colored and yellow-skinned people and, in the latter's case, to its colored and olive-skinned people.

Persons of red, yellow, or greenish skin who . . . contrary to what has been sustained for a long time and is still sustained by many black-skinned people, be they in Africa, Australia, or elsewhere . . . have never admitted and, less than ever, do not acknowledge that supremacy over the soil belongs, even during the night, to any other species but their own.

It is in reflecting on the moral and muscular energy of the American Indians, Asiatics, and Malays (hunters, fishermen, or shepherds) that I have come to speak of red, yellow, and olive-skinned people as not allowing co-proprietors in the localities that they frequent.

Well, messieurs, if I must muse about and cite the human varieties that do not admit to equals in guile or in material dexterity, I would talk to you about (in regard to the first of these qualities) certain Chinese who are almost white, having skin and lungs that willingly work and act like our people's; and (regarding the second quality) I would discuss certain Indians and Malays whose skin (respectively red and sufficiently dark green) functions, respectively, like that of the blacks inhabiting the very dry countries, and like that of the blacks inhabiting the very humid countries.

VII

The white races of our species I reflect upon next.

These races, I maintain, merit the surname *human mental variants*;

Because they comprise the specimens of what man is to the physical as well as to the moral;

When his entire vegetative system and entire animal system have, as much as possible, been sacrificed up to the smallest details to the perfectionment of all the organs, tissues, elements, humours, nerves, plexuses and ganglions that serve him to aesthetically explore the world; and, at the same time, to the maximum development of the cortico-cerebral surface that serves him likewise to render judgment.

Speaking thusly, I then allude on the one hand to the whites of the New World, that is to say, to the Polynesians, Hawaiians as well as the Maoris; and, on the other hand, to the whites of our Old World, that is to say, to the Europeans;

Given that one ought to admit that Polynesia and Europe are the only regions on Earth where it is that white people are produced.

VIII

I next talk at length about the whites of the New World—specifically, the Polynesians: whites who have most especially put their intelligence to the service of their sentimental encephalic activity.

In order to well understand the nature of the problem which has (more than any other) preoccupied this genre of mankind, it is important to know something about Polynesia and its resources.

Therefore, messieurs, allow me a few words along these lines.

— In all of Polynesia the climate is always so favorable to man (when it is not truly delightful) and the soil so prolific in fruit and vegetables only (when it is not, in fact, too prodigious) . . . that the physico-chemical agents, plus the solid, liquid, and gaseous nutriments, as well as the mechanical impulses, which our organism needs for living and acting, are not lacking to him.

Hence, from the vegetative point of view as well as from the animal (that is, the physical) point of view, the Polynesian cannot have any serious apprehension.

Consequently, he is perfectly free to devote himself to the mental life, perfecting his intelligence in giving employment to the solution of social and moral problems.

Now, these social and moral problems always pose themselves before him, and moreover pose themselves in a totally special way. Here is how.

In Polynesia one only finds in the form of meat or, what is all the same, edible animals:

Firstly, as mammals, very rare wild dogs which only exist in Polynesia or New Zealand;

Secondly, as penniforms, rare birds of short or moderate height (save the *apteryx* and the *moa*, New Zealand species that have either nearly or totally disappeared), of which the best or least foul are migrators;

Thirdly, as squamoid crawlers, being so tiny that one would certainly not gather them if the religion of taboos did not formally recommend to utilize them as condiments;

Fourthly, as squamoid swimmers, fish few in number, despite the immensity of the Pacific Ocean—fish so dangerous in certain waters and in certain seasons that it is sometimes necessary for the fisherman to reject nineteen twentieths of his catch in order to not be poisoned;

Fifthly, as Articulata, creatures that are as difficult for the natives to fish for as they are to dispatch.

Sixthly and finally, as mollusks, a certain number of shellfish that are as difficult to break open (when one has to swallow them raw) as they are painful to digest, when it is necessary to eat them cooked.

Now, what is this man? if not an omnivore, eminently sociable, very much more a devotee of meat than of fruit or vegetables . . . a being whose brain develops itself so much the more than the animal that it governs, and who is (to judge by our own European, mainly Western World, alimentary mode) provided with a richer and more easily assimilable nourishment, in other words, more carnal and better seasoned.

Therefore, in Polynesia the representatives of our species (not having anything better to do than to develop themselves mentally and to perfect their sensori-intellectual machine; and you see, in a few, how their climate allures them!) find themselves at all times in the presence of a very difficult problem, which is:

Being a human being who is ever a devotee of meat and whose society is constantly organizing itself more and more perfectly, that is to say, as a collectivity sparing more and more the life of the man and his body . . . ; this aforementioned man (with his aforementioned body) becomes the sole game of real value others can consume in order to satisfy, I repeat, the appetites of omnivores that a growing civilization renders more and more carnivorous.

— This problem, much more important from the spiritual point of view than from the material point of view . . . because, with what they have to eat, it is not at all the quantity that is troubling, but rather the taste, the lack of nitrogen . . . how has the intelligence of the Polynesians tried to resolve this problem, first materially, and then morally?

Materially, that is to say, formatively and culinarily, the intelligence of the Polynesians has resolved it:

Firstly, by inventing and adding to their cooked food and stew certain mayonnaise sauces (made with lemon juice, small red pimento, sea-water, and crushed coconut), like the ones that people on Tahiti eat;

Secondly, by likewise inventing certain alimentary preserves (butyrically or caseically fermented), such as their poi;

Thirdly, by inventing certain animal condiments, such as smoked eel, lizards, small pressed fish, etc.;

Fourthly and finally, by also inventing certain alcohols, such as kava (a kind of beer, ptyalogically fermented, that is unable to be preserved even for an hour) and brandy made from oranges.

— This then, messieurs, is how formatively and culinarily the Polynesians resolve the problem, half gastronomic and half social, that their land poses them.

Now, morally this problem (from this perspective, half of which is addressed by the Polynesians' political institutions and half by their religious regulations . . . half by the fruits of their practical experience and half by the fictions created by their intelligence, naively speculating on the appearances of the world and the sensations of their own organism without any sort of scientific accuracy), half gastronomic and half social, how have they resolved it?

The Polynesians have resolved this very same social problem: firstly, from a political point of view, by going through the five primary phases of warlike civilization . . . cannibalism, saturnism, anthropophagy, brigandage and then finally slavery . . . without being able, however, to perfect the latter two;

And morally, in the next place, by firstly creating the fine and noble civilization of taboos, which still so worthily directs the Tongans, who I observed in 1845; and secondly, by composing their genesis, which some day soon I shall read to you, as well as their legends, poems, and songs, some of which I shall also acquaint you with.

Now, I mean by *cannibalism*, this first phase of warlike civilization, during which man still remains so much a savage, that he does not hesitate (if such should be the case) to kill his own tribesman in order to eat.

By *saturnism*, this second phase of warlike civilization, I mean where (with the human pack becoming permanent) men only kill for eating purposes the most feeble and least useful of their group's members (the smallest of all the children, for example); and this is done only when it is an absolute necessity.

By *anthropophagy*, I mean this third phase of warlike civilization which prescribes in an absolute way the respect of the life of every other tribal companion no matter what, and no matter how small that he may be, and only allows (in committing homicide for the aim of satisfying an irresistible carnivorous appetite) for the murder of an enemy or (what is all the same to this social age) a foreigner.

By *imperfect brigandage*, I mean this fourth phase of warlike civilization which (outlawing more than ever homicide against any member of the tribe) does not authorize the murder of a foreigner or enemy and (consequently) his mastication, except under self-defense.

Finally, by *slavery* (likewise *imperfect*), I mean this fifth phase of warlike civilization which . . . being less pure in the modern Polynesian world than in our old Greco-Roman antiquity . . . prohibits the murder of a defeated foreigner after combat, and also orders that he be kept as an instrument of work; but, it does, however, tolerate that he be killed whenever one has great social events to celebrate, such as a birth, marriage, the death of a chief, a peace pact, etc., etc.

In a forthcoming presentation to you, messieurs, I shall talk about the white races of our Old World, and of the permanence and universality of the three great varieties of our species, or rather of its three main prototypes.

Perhaps I told you at the time—then again, perhaps not—but Charles de Ujfalvy's mountain sickness talk in May served me well when I accompanied Le Bon to the Tatra mountains the following year; when presented a choice, I always chose the gradual incline during ascents, and made sure to eat a full meal before long climbs. As a result, I never came down with the affliction, though Le Bon experienced difficulty once.

Another talk worthy of note is the one given by Francisco Moreno in early July. My anthropometric studies had not yet considered prehistoric skulls of the type that he displayed to us, and so I recall these proving of great value to my research. I remember your perfect quip after the Discussion that the real motherland of the Neanderthal will turn out to be not the austral regions of South America, as Topinard conjectured, but rather the meeting room of the Anthropology Society!

In November Colonel Duhoussset gave a short discourse on capital punishment which, if you forget, highlighted the physiological effects experienced by executed Europeans and Moslems (these being in the former significant, denoting resistance at time of death; in the latter none or slight, evidencing nonresistance, if not joyful acceptance). Le Bon was especially intrigued by the Colonel's stories about the Mohammedans' unique mind-set, and this mind-set, with all its implications, is thoroughly described by our friend in his monumental 1884 book, "*La Civilisation des Arabes*," a copy of which I have, should you not have one yourself; I'll loan you mine, if you want.

“Some Observations on the Mountain Sickness Experienced by Travellers in Central Asia”

by Charles de Ujfalvy

ANTHROPOLOGY SOCIETY OF PARIS

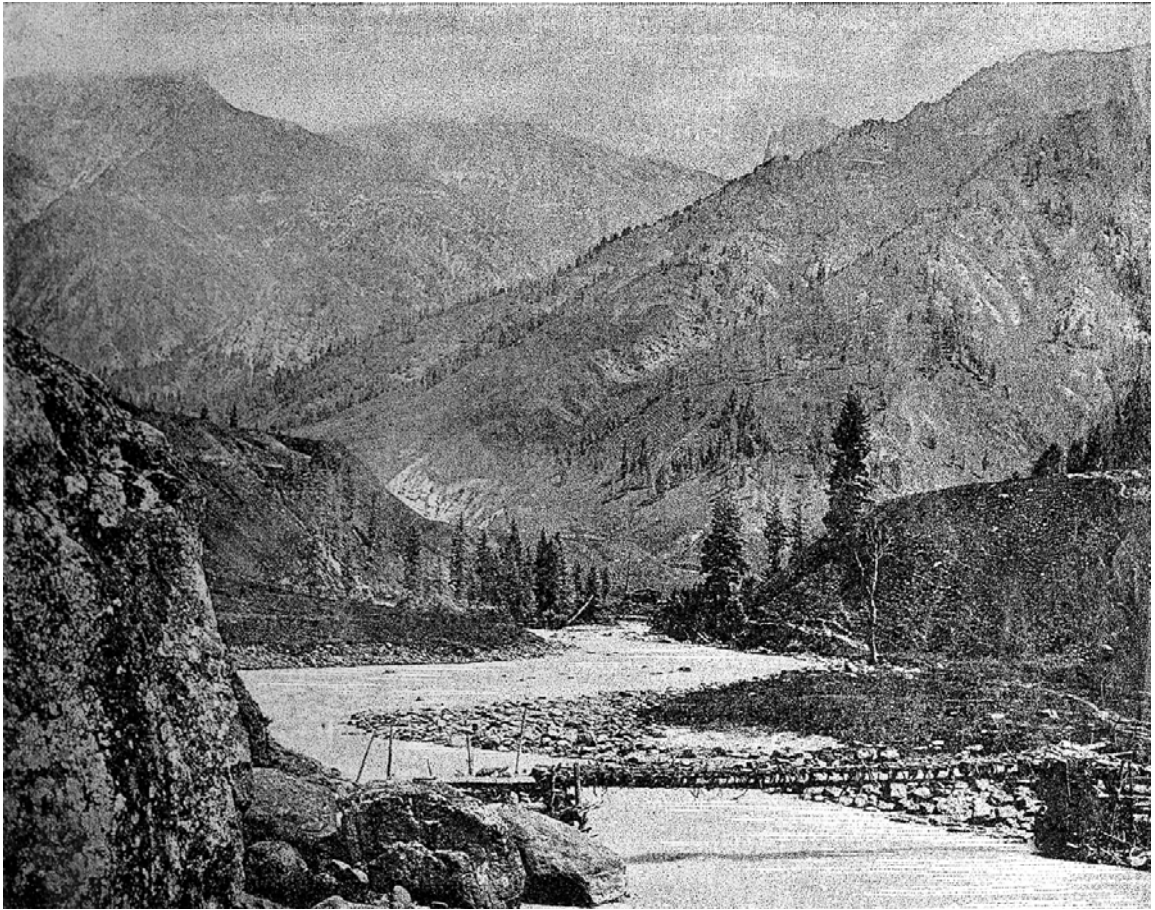
Meeting of May 6, 1880

In one of our previous meetings I had the occasion to discuss with you a trip that Monsieur Panajiotis Potagos had taken across central Asia. In betaking himself from Kabul in Afghan Turkestan, Monsieur Potagos passed over the Hindu Kush (June, 1870) by means of a little resorted to and quite elevated mountain pass (14 to 15,000 feet, or about 4250 to 4600 meters), named the Kaoshan.

Monsieur Potagos had expended six hours in reaching the summit of the passage, and he said that many of his companions who had not eaten during the ascent suffered a violent attack of bulimia, which was followed by lipothymia that lasted for 15 to 20 minutes. Upon being rubbed with snow, they revived and did not experience any more discomfort. The persons struck by lipothymia presented a bluish aspect as well as a slow pulse, and Monsieur Potagos attributed this state to the rarefaction of the air, which caused a slackening in the circulation of the blood among the persons who had hardly eaten since that morning. In crossing the Pamirs, Monsieur Potagos did not have any further opportunity to verify the existence of this phenomenon (July, 1870).

In discussing the Pamirs, Marco Polo said this in his account (Chapter XLIX): “No bird flies there due to its high elevation and coldness. And if fire can be said, on account of this great coldness, to be neither so radiant nor so warm as it is elsewhere, so also can it be said to not cook meat as well.”

Captain Wood (1837), in crossing the Pamirs, observed the phenomena that the rarefaction of the air at high elevations produces, and also confirmed the assertions of the Venetian traveller. He states, “I tried to measure the width of the lake (Sor-Kul, 4764 meters above sea level) by the propagation of sound, but my attempt failed because of the thin air. A musket, cartridge loaded but without ball, will detonate here as if the load had been simply poured into the cannon without use of rod and wad. Loaded with ball, the discharge is very strong, but it doesn't have the sharp reverberation that a similar load produces in atmospheres more dense. The ball, however, can be distinctly heard to whistle in the air. The human voice is noticeably affected, and conversation, above all if it is conducted in a raised tone, is not able to be sustained without one becoming quickly exhausted; the slightest muscular exercise will lead to a similar result. A half-dozen blows struck with an ax will so weaken the workman that he will drop down on the ground, totally drained; *and although a few moments of repose are sufficient for enabling normal breathing to resume, work continues to be impossible.* A march of 50 meters at full speed will force one (even if carrying a light load) to stop and pause in order to breathe. On the plateau of the Pamirs



Pass through the Hindu Kush

my pulse averaged 110 beats per minute; the other men under my command averaged 112, 114 and 124 beats per minute.” (*A Journey to the Source of the River Oxus*, p. 361).

The party of the Forsyth expedition who under the command of Goydon had been able to penetrate up to the heart of the Wakhan did not observe any of the aforementioned effects of the rarefaction of the air upon its expedition's members. Their state of health had always been excellent. (April 26 to 29, 1874).

DISCUSSION

Doctor ARTHUR BORDIER. Mountain sickness has been the subject of a thoroughly performed study by Doctor Jourdanet which appears in his work entitled: *Influence de la pression de l'air sur la vie de l'homme*.

One must not forget that mountain sickness always makes itself more rapidly experienced when one carries out his ascent by way of a steep slope than when one goes up a gentle slope.

It is in this manner that certain localities in the Alps have the reputation of inflicting mountain sickness more so than others. The reason for this inequality is that the road that leads to these places is steeper than is customary. Some travellers are mistaken about all this: the Chinese, for example, attribute mountain sickness to local causes that have nothing in common with this discomfort.

Monsieur GABRIEL DE MORTILLET. I myself have observed the exactness of your observation, Doctor Bordier. Before the Mont Cenis Tunnel was completed at Modane, I had often traversed the Mont Cenis pass by foot or stagecoach; now, mountain sickness hardly made itself felt when I would go from France into Italy because, in fact, the slope is relatively mild from the Savoy side, and also because the difference in elevation between the bottom of the valley at Lanslebourg and the summit of the pass is only about 500 meters. On the other hand, whenever I would go from Susa into France, mountain sickness always attacked me to a certain degree, affecting above all my ears and hearing, because on this side the ascent is much steeper and the difference in elevation between Susa and the summit of the pass is at least 1500 meters. This effect makes itself felt whether I go by foot or stagecoach.

Monsieur PAUL DE JOUVENCEL. I too have experienced the same effect, in my case while going up in a balloon, by reason of the swiftness with which the aerostat rises in the air.

Monsieur CHARLES DE UJFALVY. I would like to know, Doctor Bordier, if mountain sickness makes itself felt more on an empty stomach than after a meal?

Doctor ARTHUR BORDIER. I think, Monsieur de Ujfalvy, that the difference must not be much. It appears to me, though, that having a meal would produce a condition somewhat favorable for one's avoiding coming down with mountain sickness.

“Two Prehistoric Skulls Brought Back from the Rio Negro”

by **Francisco Moreno**

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of July 1, 1880

Messieurs, these two skulls originate from ancient cemeteries near the Rio Negro. They are representatives of races who lived, and were already extinct, before the Spanish conquest. This cranium I am now holding, which shows pathological characteristics, was exhumed by me from a sandy, yellowish bed of clay that is totally like the Quaternary period silt of the pampas; this type of bed forms the ancient discontinuous alluviums of the Rio Negro, which make their appearance as knolls or as rims on the river's edge, like old sandbanks or islands of low elevation of an ancient delta. Near this cranium I did not find any bones of extinct animals, but a few hundred meters away I discovered some fragments of a carapace of a glyptodon, which presented the same exterior appearance. This cranium has the same color, and the condition of its bone is completely the same, as that of the majority of Quaternary remains.

Now, this second skull, as you can see, is more modern, but still very old; I extracted it from ancient dunes (originally shiftable but which are now solid) which in bygone days bordered the islands of the old river at its mouth with the Atlantic, near Carmen de Patagones. The first skull was found at a depth of nearly 4 meters, this second at 2 meters under the sand. This latter skull is deformed after the manner of the Aymaras and shows the beginnings of scraping under the parietal. These two skulls, I should add, are not representatives of the two races which formerly inhabited the Rio Negro near the ocean.

It is important to note that in the ancient cemeteries adjoining the Rio Negro one finds many cranial shapes. The first and oldest is that represented by the cranium I just showed you. Now, this race lived, I believe, during the glacial era in Patagonia, times nearer to today than those of the glacial epoqe of Europe. Later (but not very much later, I believe), one sees the appearance of a race represented by a Neanderthal type, rather similar to the Botocudos, but without having a very pronounced flattening and convexity of the skull. The skulls of these two races were buried in ancient dunes. Later on, a very prognathous cranial type appeared, whose posterior or occipital part of the skull, instead of being very elongated and enlarged, is rounded and the base is inclined in front; one finds here both a normal type and a deformed type (fronto-parietal deformation). Later still, one sees the type known under the name of Aymara (I myself have found more than 100 skulls of this type), and they are all blackish. It is difficult to say if this Aymara type is contemporaneous with or came after the flat-head type, 50 of which one is able to see at the Archeology Museum of Buenos Aires. The more modern types—types which have perpetuated themselves up to this day—are the Pampeans and the Patagonians or Tehuelches, whose skulls are generally brachycephalic and deformed by flattening of the occipital. With respect to these latter races one finds many skulls that have been painted red.

In the inland grottos where I have performed some excavations, the skulls one finds are of the ancient Pampeans. In one spot near the Rio Chubut that I excavated I also found more old Pampean skulls; but, along with the mummy I discovered at Lago Argentina I mainly came across a cacique or Aymaran skull type, rather than a Patagonian type of the living races. Incidentally, messieurs, the drawings that decorate the rock shelter where I found the mummy are nearly the same as those discovered in Arizona.

DISCUSSION

THE PRESIDENT OF THE SOCIETY (Monsieur CHARLES PLOIX). In the name of the Society, I wholeheartedly thank you, Monsieur Moreno, for your most interesting presentation. You should know, messieurs, that Monsieur Moreno's travels throughout Patagonia can truly be described as heroic. We owe nearly all that we know of Patagonia to this very courageous explorer, who only escaped death thanks to the presence of an extraordinary spirit. (Applause.)

Doctor ARTHUR BORDIER. I think it worth pointing out the clearly syphilitic lesion on one of the skulls you just showed us, Monsieur Moreno, even though the person whose skull remains we now behold lived in a time that was certainly anterior to the arrival of the Europeans.

Doctor PAUL TOPINARD. I wish to discuss these two skulls from another point of view. They are the oldest authentic skulls of America that we are aware of, and most particularly the oldest from the austral regions of South America. Both skulls originate from the alluviums created by the glacial origin of the Rio Negro river. It goes without saying that the word *glacial*, with respect to this region, is not made with allusion to anything analogous to our glacial epoque in Europe, for we are ignorant of the chronology of the terrane and fauna of Patagonia and the Rio de la Plata. However, there is some reason to believe that the alluviums, or *river beds* as the English call them, are considerably old and at least predate the Christian era by several thousand years. Now, these two skulls occupied different levels in alternate beds of sand, gravel and rolled, striated pebbles; one at a depth of 15 feet. Well, both skulls are artificially deformed, and one of them especially, as you pointed out, Monsieur Moreno, presents the classic elongated, cylindrical, and slanted deformation with its two frontal depressions and post-bregmatic characteristics, known under the name of *Aymara*.

This skull then unexpectedly resembles another one, classified as *Nahua*, that's in our collection, one which Abbé Brasseur of Bourbourg had donated to us and which up to now had been regarded as the oldest known example of cranial deformation; but, the deformation in this case is different: it is one created by antero-posterior and raised compression.

Nearly all of the cranial deformations widespread throughout the two Americas today or in recent times can be categorized under two fundamental types: one being elongated, the other flattened from front to back; and here it turns out that these two types are already represented on the two oldest authentic American skulls that we possess. There is something else most curious, messieurs. The two deformed skulls were found far removed from one

another: the Aymaran one you showed us, Monsieur Moreno, hails from the confines of Patagonia, whereas the one provided us by Abbé Brasseur comes from the outskirts of Palenqué in Mexico. It appears therefore that the custom of deforming the skull and its two principal modes originates in America from however far back in time as we succeed in recovering remains of man there.

The other skull you showed us, Monsieur Moreno, the one found at a depth of 15 feet, is also deformed, but the kind of deformation it was subjected to is different. It is not the usual Aymara type, but rather the frontal deformation inclines gradually from the base of the forehead up to the vertex, which is similar to the Toulousian deformation that Doctor Broca talked about in his presentation to us last year. Incidentally, should it be said that this skull possesses something of a Neanderthaloid quality, this is an error; it is, in reality, greatly deformed.

But, this reminder of the Neanderthal leads me to the second point I wish to discuss—that is, the 50 nearly life-size photographs of skulls that you offered us, Monsieur Moreno, after the last Universal Exposition, and which I have circulated.

It is important to note that Monsieur Moreno's discoveries deal with, as I call them, three kinds of skulls or stages: 1) modern skulls, corresponding to ones of the Tehuelches or present-day Patagonians as well as to ones of the Puelches of the Araucanian race, who live more to the north; 2) skulls dating back several centuries, excavated from levels where one still finds polished stone and sharpened arrowheads, characteristics of and springing from the celebrated prehistoric *paraderos*; and 3) the oldest skulls yet, extracted from grottos that are often encrusted with calcareous stalactites, or found in alluviums, like the two shown to us today.

Now, in your photographs, Monsieur Moreno, it's clear that besides normal skulls you also found deformed skulls of many shapes, some in the manner of the two that I have dwelled on, some otherwise. Among the normal skulls, three principal types are observed, plus cases of apparent or obvious crossbreeding. The first type is both brachycephalic and hypsicephalic; Monsieur Moreno attributes this type to the present-day, widespread Tehuelches and to their more or less distant ancestors. The second type, which is dolichocephalic, I myself have highlighted in my book on *Anthropologie*; it approximates the eskimo type, and it manifests itself especially in the prehistoric *paraderos* and in the grottos. The third type, likewise dolichocephalic, is also platycephalic; with its sunken parieto-occipital region, quite prominent supraciliary arches, and very receding forehead, it corresponds exactly to the skull type of the Neanderthal. I have, as I indicated, circulated photographic examples of each of these cases, and of this latter case there are six or seven that are shown in profile.

One wonders if the Neanderthal in Quaternary times will prove to have been accidental in Europe, and if its real motherland will instead turn out to be the austral regions of South America. The authors of *Crania ethnica* have taken great pains to assemble some cases of Neanderthal man having inhabited Europe; by contrast, such cases are frequent in Patagonia.

Doctor JACQUES BERTILLON, Sr. I wish to draw our attention to the first skull that you showed us, Monsieur Moreno. It seems to me extremely likely that the osteitis which we see profound traces of in this skull is syphilitic. This osteitis had evidently been of long duration, and I don't see that anything but syphilis could have been the cause of it. The general shape of this skull is not less remarkable. Doctor Topinard, a few minutes ago you said that it is deformed; this is an opinion in which I have difficulty sharing: is the skull of the Neanderthal ever passed for as being deformed? Indeed, messieurs, I don't see on this skull the flattened areas which accompany artificial deformation and which are so visible, notably on the deformed skulls of the Aymara.

Now, we can see that this skull presents transversely a kind of wide groove; but, a similar anomaly is often met with in modern skulls that have not been deformed; in fact, sometimes one sees it traversing the skin on baldheaded individuals.

Nonetheless, there is no question that this skull is extremely assymmetrical. It is almost bent along the direction of its length; the middle is tilted towards one side, and the external occipital apophysis does not lie on the axis of the skull.

Doctor ERNEST HAMY. I find, Monsieur Moreno, that the second skull you showed us, which is dark-colored, calls to mind trait by trait the skulls of the Aymara. It is strange to see the same skull deformation used in Patagonia and Mexico, two geographical points located such a great distance from each other. I would like to know, Monsieur Moreno, the exact stratum where you found this skull.

Monsieur FRANCISCO MORENO. As I indicated earlier, it came from ancient sand dunes which today are solidified; they are located near the ancient islets of the Rio Negro. The skull was excavated from violet-colored sand at a depth of 10 feet.

Doctor ERNEST HAMY. Among the American skull shapes, there is one which especially merits our attention: this is the cubic type. The skull that Morton has deposited in the museum at Philadelphia belongs to this type. Two members of the scientific expedition of Mexico have also observed this shape in that country, in trenches that had been dug.

Doctor PAUL TOPINARD. We should also recall that Monsieur Florentine Ameghino published earlier this year in the *Revue d'anthropologie* a memoire where it resulted that in the Argentine Republic man was contemporaneous to animal species, such as the giant armadillos, that nowadays are extinct. The remains found by him at a great depth, below alternate layers of marl, sand and clay, mixed with worked goods and the bones of extinct edentates, belonged to a small, old woman, and presented signs of osseous alterations and deterioration. These have been determined in Doctor Broca's laboratory.

Doctor PAUL BROCA. We ought to be reserved with regard to the geological chronology of America in general, and notably with that of South America. Even in Europe, where records are already so numerous, we possess uncertainty over a certain number of regions. All the more reason, messieurs, why doubt is in order whenever we speak of a part

of the world such as South America, which is even less understood from the geological point of view.

What we can say at present, though, is that no rigorous zoological parallel exists between the two continents. For example, we know that the mastodon still roamed North America in the Quaternary period.

However, we have great interest in knowing to what period the cubically deformed skull you spoke about, Doctor Hamy, dates back, a skull which seems to me to be characteristic, because it looks like it can be confirmed that there existed relations between two distant populations that shared one with the other an identical practice. Now, the deformation that we have before our eyes today appears to me like the one of the macrocephalic skulls of the Crimea, which one finds along the Danube and also in the Jura. We know that probably there were extensive communications between Europe and America in the Tertiary period; but, up to now nothing has established that such communications also existed in the Quaternary period.

As for the traces of osteitis on the first skull you showed us, Monsieur Moreno, traces that Doctor Bertillon and Doctor Bordier remarked upon, I believe that they were not caused by tuberculosis or trauma; instead, I think like you, Doctor Bordier, that tertiary syphilis will prove to be the sole cause. No doubt, messieurs, you recall the skulls of children that have been brought back from Peru, and on them one will ascertain lesions that are attributable to the same cause. This first skull you produced today, Monsieur Moreno, seems to me to be more demonstrative yet. If it were the only one that we had in this category, one might delay before pronouncing a verdict; but, it must not be forgotten that we already have many others that are conclusive in the same sense. Nevertheless, a formal affirmation as to the cause of this skull's osteitis seems premature.

Additionally, I do not think that syphilis has been, as some maintain, transmitted from America to Europe. The Latin poets have described this malady with a certain degree of complacency, and not one surgeon today will contend that syphilis had not existed on our continent a long time before Christopher Columbus.

Doctor ARTHUR BORDIER. Your point is well taken, Doctor Broca. I recall observing presumably syphilitic lesions on Polynesian skulls that were on display in the anthropology gallery of the 1878 Universal Exposition. At the same time Doctor Prunières exhibited some prehistoric pieces that evidenced the same lesions.

“The Physiological Effects of Capital Executions”

by Colonel Émile Duhousset

ANTHROPOLOGY SOCIETY OF PARIS

Meeting of November 18, 1880

Messieurs, as you recall, at our last meeting a prolonged and learned discussion with regard to a vile executed criminal took place.

During this discussion I asked if in the case of asphyxia and luxation, which spontaneously occur in the most absolute way under the guillotine, the condemned is not in a state of revolt followed by stupor capable of causing an inflammation, overtaking his sickly paroxysm at the moment when the spinal marrow is sectioned; and, resulting from this violent commotion is not a bloody discharge from the brain produced?

Indeed, I believe we will perhaps ascertain to a greater degree a case of fulminating apoplexy if the retributive blade is allowed to be stopped halfway on its journey. Now, I shall pose another question: when death is produced mechanically, might not the resulting commotion and asphyxia engender disorders of which the mass of the brain bears traces?

As all organs of a living animal are subordinate to the brain, it follows that moral sensations have an influence over natural functions. In fact, is not the reciprocal also in effect? Each day we see proof of this in the most ordinary details of daily life: heat, cold, hunger and so on modify the way in which we appreciate things. A young soldier, I have often witnessed, can have the most stable disposition and yet be physically indisposed by the effect produced on him by the first volley of grapeshot sailing above his head; additionally, I have seen the same disorder suddenly manifest itself upon a man of proven and energetic character, by means of the simple delivery of a telegram.

I would like to share with you some observations drawn from my assignments in Persia and my military career, whose contingencies have permitted me to be a witness to all sorts of violent deaths; I shall not discuss here the particularities of certain Persian forms of corporal punishment, as such will not add anything to the question I've formulated.

The passage from life to death, in the case that presently occupies us, of an individual who reaches a state of paroxysm from being terror-stricken due to the progression of terrible anticipated circumstances, does a similar method of execution leave any trace on the brain of a Moslem man, to whom death, also by the blade of the law, only offers to him the image of his being delivered to the gates of paradise of Mohammed? Those who like myself have viewed Moslems dying are able to express doubt that such a trace will be found.

To justify the point I am advancing, I shall now relate two examples that tend to establish the existence of a difference on two brains, one of which submitted tranquilly to a prompt annihilation, while the other presents the signs of a violent struggle.

Firstly, the day after the Battle of Woerth I saw and studied some extraordinary cases of muscular contractility in individuals whose vital principle had been suddenly done away with, observing these in interlacings of cadavers who had conserved for 24 hours their last gestures of fright and resistance at the moment when death had seized them.

Secondly, one morning in Persia, being at the camp of the Sultan, I saw reposing near a stream some men whose demeanor attracted my attention. They were six prisoners; three had their legs inside a cangue, a triangular-shaped heavy wooden collar used throughout the Orient; the other three knelt down in succession and the executioner, lifting up each one's beard, quietly slit their throats by cutting the trachea artery with a pocketknife.

When it was the last one's turn, the executioner paused an instant in order to sharpen the knife's cutting edge, rubbing it on a band of hide which hung from his belt; during this critical waiting period, the condemned man responded with the greatest calm to a trivial question.

None of the condemned ever complained or protested. There were, by chance, four or five onlookers present, but no guards or assistants. It only took a few minutes in order to make these three into cadavers. The other seated prisoners looked on and one of them signaled to me that tomorrow it would be his turn.

At the moment of death I have, in fact, observed almost a smile on the features of Persians. For instance, twelve hours after the execution, when I sketched the three dead men lying as they were left on the ground in their final bodily position, each one's visage maintained the appearance of great placidity. I recall remarking on this the same day to my companion and friend, Doctor Tholozan, comparing this state of the face with the one that results from French executions.

In Africa, I should mention, death sentences are performed on the natives who also endure them with the greatest submission.

Now, in earlier times throughout a large part of the Orient the head was cut off with a yataghan, and often the executioner demanded the condemned to lift up or bend his head—in a word, to well position it for his prompt beheading; the beheading was then carried out by the executioner without the least emotion and as the accomplishment of the most ordinary act of life. Doctor Bonnafond, who during a long medical career in Africa made numerous observations on the Arabs, will certainly corroborate my statement.

To conclude, has there not therefore been good reason for me to bestow special attention on the facts relating to the nature of those who I have seen to describe and who at first glance appear not to figure in the course of the debate? I shall leave that to your best determination, messieurs.

Well, I have pretty much reached the bottom of my piles most of interest to you. Are you not satisfied?

And now I shall share with you my strongest desire. It has, I know, been so very long, but how much I wish that you could reappear and unsilence these rooms. I dream of us once again putting our favorite Society morons in their place, spending pleasant summer evenings at Henri's with giants like Le Bon and Professor Kuhn, and yes, even conducting great research that ultimately ends up being ignored or dismissed.

Must we now only confine ourselves to reminiscences?

Your friend . . . always,
Robert